THE LANCET

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

Telegrams—LANCET, WESTRAND LONDON. *Telephone*—GERRARD 4314 & 4315. *Offices*—423, Strand, London, W.C.

No. VII. OF VOL. II., 1928.
No. 5477. Vol. CCXV.

LONDON, SATURDAY, AUGUST 18, 1928
Founded 1823. Registered as a Newspaper. Published Weekly.

Pp. 112—Price 1s.
Annual Subscription
Inland £2 2s. Abroad £2 10s.

OXFORD MEDICAL PUBLICATIONS.

SEE PAGE 3.

IN THE PRESS
The FOURTH (1928) VOLUME of
MODERN TECHNIQUE IN TREATMENT.
Important Announcement.
See pages 4, 5 & 6.
London: THE LANCET, Ltd., 1, Bedford Street, W.C.2.
Sole Agents for India: Butterworth and Co.

RADIUM IN CANCER,
AND
THE SURGERY OF ACCESS.
By ARTHUR B. SMITH, M.B., F.R.C.S.E.,
SYDNEY M. SMITH, M.B., Ch.B.Ed.
A brief Illustrated Outline of Recent Advances in the Technique of Treatment of Cancer in General Surgery, Gynecology, Laryngology and Dermatology.
With 18 Illustrations. 56 pages. Price 3s. 6d. net; postage 3d.
London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C. 1.

NEURITIS AND NEURALGIA.
By
WILFRED HARRIS, M.D., F.R.C.P.,
Senior Physician to St. Mary's Hospital, and to the Hospital for Epilepsy and Paralysis, Maida Vale.
Cloth. Demy 8vo. 436 pages. Illustrated. Price 12s. 6d. net.

Oxford University Press, Amen House, London, E.C.4.

JUST PUBLISHED. With 25 Illustrations including 17 Plates. Demy 8vo. 9s. net; postage 5d.
STERILITY IN WOMEN:
DIAGNOSIS AND TREATMENT.
By SYDNEY FORSDIKE, M.D., B.S.(Lond.), F.R.C.S.(Eng. and Edin.)., Surgeon to the Hospital for Women, Soho Square, London; Gynæcological Surgeon to the Kensington, Fulham and Chelsea Hospital, etc.
London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C.1.

ON THE BREAST.
By DUNCAN C. L. FITZWILLIAMS,
C.M.G., M.D., Ch.M., F.R.C.S. Ed. and Eng.
Royal 8vo. 456 pp. 2 Plates, 166 Illustrations. 30s. net.
LANCET.—"The book is packed with accurate clinical observations and bears evidence throughout of extensive clinical experience and wide reading on the part of the author."
Wm. Heinemann (Medical Books) Ltd., 99, Great Russell Street, London, W.C.1.

BY CHARLES J. HEATH, F.R.C.S.,
Consulting Aural Surgeon, Metropolitan Asylums Board; late Surgeon, Throat Hospital, Golden Square, London.
OTITIS MEDIA (MASTOID DISEASE):
ITS SYMPTOMS, DIAGNOSIS, PROGNOSIS AND TREATMENT BY MODERN METHODS, thus saving the hearing of the discharging ear with perforated drumhead.
Price 5s.; postage 3d.
"We have no hesitation in describing Heath's paper as epoch-making."—ST. BARTHOLOMEW'S HOSPITAL JOURNAL.
"This work is recommended to specialists and even to those who are not."—L'OTO RHINO LARYNGOLOGIA INTERNATIONALE.
Baillière, Tindall & Cox, 7 & 8, Henrietta-st., London, W.C.2.

NOW READY. 4/6 net.
THE TREATMENT OF
CHRONIC DEAFNESS
BY THE ELECTROPHONÖIDE METHOD OF ZUND-BURGUET.
By GEORGE C. CATHCART, M.A., M.D.,
Consulting Surgeon to the Throat Hospital, Golden-square.
Oxford University Press, Amen House, London, E.C.4.

CANCER OF THE BREAST
AND ITS TREATMENT.
By W. SAMPSON HANDLEY, M.S., M.D. Lond., F.R.C.S. Eng.
Second Revised Edition. With 82 Illustrations. 30s. net.
Published for the Middlesex Hosp. Press by John Murray, London.

BY LIEUT.-COL. ROBERT HENRY ELLIOT,
M.D., B.S. Lond., F.R.C.S. Eng., I.M.S. retd.
A TREATISE ON GLAUCOMA.
2nd Edition, Revised and Enlarged. 30s. net.

TROPICAL OPHTHALMOLOGY.
With 7 Plates and 117 Illustrations. 31s. 6d. net.
Spanish and French Editions, 1922. Full German Abstract.

THE CARE OF EYE CASES: 12s. 6d. net.
A MANUAL FOR NURSES, PRACTITIONERS, AND STUDENTS.
Chinese Edition. Oxford University Press.

GLAUCOMA 4s. net.
A HANDBOOK FOR THE GENERAL PRACTITIONER.

THE INDIAN OPERATION OF COUCHING FOR CATARACT.
7s. 6d. net. H. K. Lewis and Co., Ltd.

DISEASES OF THE HEART
THEIR DIAGNOSIS, PROGNOSIS, AND TREATMENT BY MODERN METHODS.
With chapters on the Ink Polygraph, Clinical Electro-Cardiography, X-Ray Examination, and Anæsthesia in relation to Cardio-Vascular Affections.
By FREDERICK W. PRICE, M.D., F.R.S. (Edin.),
Physician to the National Hospital for Diseases of the Heart; Consulting Physician to the Royal Northern Hospital, London.
Demy 8vo. Pp. 534. With 249 text figures, including 32 sphygmograms, 92 polygraphic tracings, and 87 electro-cardiograms.
NEW SECOND EDITION. 21s. net.

"Dr. Price has accomplished his avowed object of presenting concisely information of service in the diagnosis, prognosis, and treatment of diseases of the heart by modern methods."—BRITISH MEDICAL JOURNAL.
"The most valuable and comprehensive guide to the study of Cardiology with which we are acquainted."—NEW YORK MEDICAL JOURNAL AND RECORD.
"We think that most of our readers engaged in general practice will find this work extremely useful."—THE JOURNAL OF CLINICAL RESEARCH.
"In our opinion the book is indisputably the most authoritative contribution to Cardiology of our time."—FRANCO-BRITISH MEDICAL REVIEW.
"The second edition of this popular work on heart disease bears evidence of thorough revision, while the essentially clinical standpoint of the writer is maintained."—EDIN. MED. JOUR.
"A book which we believe is destined to remain the standard work on Cardiology for many years to come."—AMERICAN MEDICINE.
"It may be said at once that the book adequately fulfils the purpose it has in view and is a perfectly sound, lucid, and reliable guide."—NEWCASTLE MEDICAL JOURNAL.
"Well-written, concise, and complete, containing a wealth of practical information. Obviously based upon the author's own experience and investigative work."—SURGERY, GYNECOLOGY, AND OBSTETRICS (Official Journal of the American College of Surgeons).
"Dr. Price is to be congratulated again on the reappearance in its second edition of his distinguished contribution to the increasingly important subject of Cardiology."—THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.

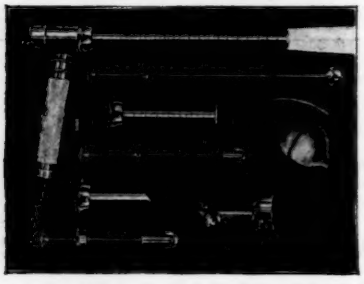
OXFORD UNIVERSITY PRESS, Amen House, Warwick Square, London, E.C. 4.

LIBRARY OF CONGRESS AUG 28

Every physician or surgeon should be an authority on Diagnosis!

Diagnosis and treatment to-day are not the simple procedures they were in the old days of the family practitioner. Present-day requirements demand that the physician and surgeon know all there is to know. The success of treatment and surgery depends upon *knowing*. And to *see* is to know. Videre est Cognoscere!

Investigation of all the body orifices and cavities by instruments especially designed for the purpose is as necessary in the practice of medicine and surgery, as the ability to treat and operate after a conclusive diagnosis has been made. For conclusive findings, the profession has universally agreed that a good illuminated ophthalmoscope to study the eye grounds; a laryngoscope and illuminated throat instruments for examining the throat; an electrically-lighted ear and nose speculum; an urethroscope; a procto-sigmoidoscope; a head light; and sterilizable lamps for insertion into the areas and tracts, etc., are all essential.



A few of Cameron's instruments are illustrated to show you what a great aid such equipment will be to you in your work.

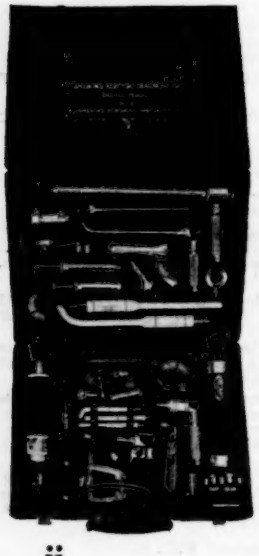
Cameron's Electro-Diagnostoset provides Trans-illumination, Direct Illumination, Accurate Diagnosis, Simplified Technique and Improved Instrumentation for all phases of major and minor diagnostic, operative and therapeutic procedure. Every lamp and instrument provides concentrated Searchlight illumination, equivalent to 150 candle-power, and all lamps, cords and necessary parts of the instruments are scientifically constructed to withstand sterilization by boiling or steam pressure.

More than 70,000, Members of the Professions use Cameron's Diagnostic Equipment.

The complete Electro-Diagnostoset is supplied in genuine leather case containing 5-in-1 (Red Free) Ophthalmoscope; Spudlite with 3 different spuds; Diagnostoscope for Ear and Nose; Mastoidlite; Oralite; Electro-Tonsilassistant; Headlite; Set of Diagnostic Lamps; Post-Nasal and Laryngoscopic Mirrors; Set of Surgilites; Parietractor; Procto-Sigmoidoscope; Anoscope; Electro-Urethroscope; Skenescope; Vaginalite; all Accessories; Extra Lamps; Special Current Controller and Battery, with Boilable Cords.

Cameron's Lamps and Instruments are known and used by the leaders in medicine and surgery all over the world.

Every set of instruments is guaranteed to give a lifetime of service and satisfaction at a minimum upkeep cost.



Let us tell you more about them. Write—Telephone—or Mail the Coupon.

CAMERON'S SURGICAL SPECIALTY CO.
OF GREAT BRITAIN.
15, Stratford Place, London, W.1
(J. T. LEACH)

Telephone:
Mayfair 3523

CAMERON SERVICE IN GREAT BRITAIN

Our London Office carries a complete stock of all equipment, and is organised to give prompt sales and delivery service.

28

CAMERON'S
SURGICAL SPECIALTY
COMPANY OF GREAT BRITAIN
15, STRATFORD PLACE, LONDON, W.1

Gentlemen:—Please send me your treatises of technique on "Diagnosis by Transillumination," and full particulars regarding Cameron's Electro-Diagnostic Lamps and Instruments. (There is to be no charge or obligation.)

NAME ..... DEGREE .....

ADDRESS .....

WHAT DO YOU SPECIALIZE IN? .....

THE LANCET

No. 5477. LONDON, SATURDAY, AUGUST 18, 1928. CCXV.

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

A CONTRIBUTION to the Study of Chorea: the Symptoms which Result from Injury of the Corpus Luysii. By J. PURDON MARTIN, M.R.C.P.—(*Illustrated*).. 315

ORIGINAL ARTICLES.

A Clinical Study of the Human and Bovine Types of Tuberculosis in Man. By JOHN T. MORRISON, F.R.C.S. 319

Sources of Infection in Non-Pulmonary Tuberculosis. By C. O. STALLYBRASS, M.D., D.P.H. 320

The Permanence of the Schick Negative State. By H. J. PARISH, M.R.C.P., and C. C. OKELL, M.R.C.P. 322

The Screened Radon Seed in the Treatment of Malignant Disease. By PHILIP GOSSE, M.D., and F. E. CHESTER-WILLIAMS, M.R.C.S.—(*Illustrated*).. 323

The Bromsulphalein Test of Liver Function. By ERNEST BULMER, M.R.C.P. 325

REVIEWS AND NOTICES OF BOOKS.

Trauma and Compensation in Obstetric and Gynæcological Cases. By D. M. Lindsay, M.D. 330

Experimental Embryology. By Prof. T. Hunt Morgan 330

Endokrine Krankheiten. By Prof. Dr. Hans Curschmann 330

The Clinical Examination of the Lungs. By E. M. Brockbank, F.R.C.P., and Albert Ramsbottom, F.R.C.P. 331

Handbuch der Pathogenen Mikroorganismen. Edited by Kolle and Wassermann 331

Concentration of Lactic Acid in Blood and Urine. By Otto Jervell..... 331

Dental Prosthetic Mechanics. By D. M. Shaw 332

Medical Women's International Journal 332

LEADING ARTICLES.

THE DETENTION OF MENTAL PATIENTS 333

RECENT FOOD INFECTIONS 334

EXPERIMENTAL DENTAL CLINICS 334

NON-PULMONARY TUBERCULOSIS 335

ANNOTATIONS.

Health Hazards in Industry 336

Influence of Posture on Renal Function..... 336

The Broad Tapeworm in North America 337

Racial Variation in the Size of Red Blood Cells..... 337

Acid Drinks and Enamelled Vessels 337

Thrombosis of the Splenic Vein 338

Therapeutic Miracles at Hereford 338

Health Talks 339

Mental Disorders in Scotland 339

Civilians and Bombardment from the Air 340

PUBLIC HEALTH SERVICES.

Reports of Medical Officers of Health: Grimsby, West Bromwich, Carlisle, Eastbourne, Tunbridge Wells, Leamington Spa, and Colchester 326

School Medical Service: Northampton, Bournemouth, and Hull 328

Infectious Disease in England and Wales 329

NEW INVENTIONS.

Improved Forceps. By DENIS BROWNE, F.R.C.S. (*Illustrated*) 332

REPORTS AND ANALYTICAL RECORDS.

Eurospa 332

BRITISH MEDICAL ASSOCIATION.

Section of Mental Diseases and Neurology: Autotoxæmia as a Factor in the Causation of Psychoses.—Cerebral States Consequent upon Head Injuries.—Early Treatment of Psychoses in Psychoneuroses 340

Section of Tuberculosis: Relation between Trauma and Tuberculosis.—Biochemistry of Tuberculosis. — Surgical Procedures in Tuberculosis..... 346

Exhibition of Drugs: Surgical Instruments, Foods, and Appliances 349

SPECIAL ARTICLES.

Congress of Radiology: Stockholm.—Radium Treatment of Intrinsic Carcinoma of the Larynx 351

Medicine and the Law: Chemist's Duty under Dangerous Drugs Legislation 353

Scotland: Medical Research 353

Ireland: Censorship of Publications 354

General Medical Council: Executive Committee.. 355

OBITUARY.

George Edward Wherry, F.R.C.S. 355

Christopher Childs, M.D... 356

THE SERVICES.

Royal Naval Medical Service.—Royal Army Medical Corps.—Royal Air Force.—Indian Medical Service.—Royal Army Medical College..... 356

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: Changes in Pensions Administration 357

CORRESPONDENCE.

The Heart and Circulation in Beri-beri (Dr. G. A. Sutherland) 358

Herpes Zoster and Varicella (Dr. Flora L. MacDonald) 359

Post-operative Massive Collapse of the Lungs (Drs. Charles R. Boland and J. E. Sheret) 359

The Vaccination Committee's Report (Dr. R. W. Jameson) 360

Ephedrine (Dr. H. W. Hales) 360

"Fussing over Cancer" .. 360

MEDICAL NEWS

Medical Society of London 361

A Nottinghamshire Orthopædic Hospital 318

Hospital Fêtes 329

Donations and Bequests .. 336

Gift to Radcliffe Infirmary 340

A Lancashire Rest Home.. 354

Sheffield Penny-in-the-Pound Scheme 358

Stirling Royal Infirmary .. 361

Marking of Surgical Instruments and Appliances .. 361

Royal Sussex County Hospital 361

An Improved Syringe for the Treatment of Varicose Veins 361

Aberdeen Royal Infirmary 361

Death of Mr. T. B. Lapworth 361

Centenary of Ancoats Hospital 361

NOTES, COMMENTS, AND ABSTRACTS.

Notes on the Slack Abdominal Wall. By Lt.-Col. J. K. McCONNEL 363

Naval Training Ashore.... 366

Is There a Neurotropic Spirochæte? 366

New Preparations..... 366

Longevity 366

Inadvertence 366

Medical Diary 362

Appointments 362

Vacancies 362

Births, Marriages, Deaths 362

LEWIS'S PUBLICATIONS.

IN ONE VOLUME. Demy 8vo. 18s. net: postage 9d.

A SYNOPSIS OF SPECIAL SUBJECTS

For the use of Practitioners.

DERMATOLOGY. By H. Semon, M.A., M.D.Oxon., Physician, Diseases of the Skin, Royal Northern Hospital, &c.

OBSTETRICS AND DISEASES OF WOMEN. By Malcolm Donaldson, M.B., B.Ch. Cantab., F.R.C.S. Eng., Assist. Physician-Accoucheur, St. Bartholomew's Hospital, &c.

EAR, NOSE, AND THROAT. By Archer Ryland, F.R.C.S.Edin., Surgeon, Central London Throat, Nose, and Ear Hospital, &c.

EYE. By John F. Cunningham, O.B.E., F.R.C.S.Eng., Surgeon, Central London Ophthalmic Hospital, &c.

"This handy volume will undoubtedly receive a warm welcome from the busy practitioner. . . . The ground covered is extensive, but the condensation is adequately carried out."—THE LANCET.

With 38 Illustrations in 12 Plates and the Text. Demy 8vo. 6s. net; postage 6d.

THE QUARTZ MERCURY VAPOUR LAMP:

Its Possibilities and Uses in Public Health and General Practice.

By J. BELL FERGUSON, M.D., D.P.H., formerly Medical Officer of Health, Metropolitan Borough of Bethnal Green. With an Introduction by Sir HENRY GAUVAIN, M.A., M.D., M.C.

"... Can safely be recommended to anyone ... clear, concise, and interesting."—BRITISH MEDICAL JOURNAL.

With 5 Graphic Charts, 16 Plates, and 33 Text Illustrations. Demy 8vo. 10s. 6d. net; postage 6d.

ARTIFICIAL LIGHT TREATMENT OF CHILDREN

IN RICKETS, ANÆMIA AND MALNUTRITION.

By KATHERINE M. L. GAMGEE, M.R.C.S.Eng., D.P.H. Lond., former Medical Officer-in-Charge, Hull Corporation Artificial Light Clinic, &c. Introduction by Prof. L. HILL, M.B., F.R.S.

"Clearly written, adequately illustrated .... should well fulfil the purpose for which it was written."—THE LANCET.

Telegrams: "Publicavit, Eusroad, London." **** *Complete Catalogue post free on application.* *Telephone: Museum* 1072

LONDON: H. K. LEWIS & CO. LTD., 136, GOWER STREET and 24, GOWER PLACE, W.C. 1. *(3 lines)*

OPHTHALMIC SURGERY

including the Author's

OPERATION FOR IMMATURE CATARACT.

By **V. NESFIELD**, F.R.C.S. Eng., Major, I.M.S. (retired),
Ophthalmic Surgeon, The Queen's Hospital for Children, London, E.

Demy 8vo, with illustrations. 9s., postage 6d.

H. K. LEWIS & CO. LTD., 28 GOWER PLACE, W.C. 1.

Price 1s. With Illustrations.

APPLICATION OF TRUSSES

to HERNIÆ. Clinical Lecture delivered at King's College Hospital. By the late JOHN WOOD, F.R.S., Senior Surgeon to King's College Hospital. Reprinted from "Medical Examiner.'
London: Matthews Brothers, 10, New Oxford-street, W.C.

STAMMERING, SPEECH DEFECTS

BEHNKE METHOD. Estab. 1882. CASES, non-resident treated at 39, Earl's Court Square, S.W.5, and, in residence, in the Summer holidays at Miss Behnke's house on the Chilterns.

"Pre-eminent success in the education and treatment of stammering and other speech defects."—*The Times.*

"Thoroughly physiological principles."—*The Lancet.*

"The method is scientifically correct and perfectly effective."
—*Guy's Hospital Gazette.*

"STAMMERING, CLEFT PALATE, SPEECH LISPING." 3s. 9d.
of Miss BEHNKE, 39, Earl's Court Square, S.W. 5

ASTHMA, BRONCHITIS & EMPHYSEMA

MEDICATED INHALATION THERAPY

HANDBOOK

Fully describing technique of Treatment with active drugs nebulized with oxygen by means of the Apneu Inhaler.

Indications of Treatment, etc., sent free on application to—
THE APNEU INHALING ROOMS, 30, Grosvenor Place, S.W1.

STAMMERING

MOST SUCCESSFULLY TREATED

RESIDENT AND DAILY PUPILS.

PROSPECTUS AND MEDICAL OPINIONS POST FREE FROM
Mr. A. C. SCHNELLE, [Tel.: Museum 3665.
Est. 1905 **119, Bedford Court Mansions, London, W.C.1.**

"GAMGEE TISSUE"

Sole Proprietors and Manufacturers:

ROBINSON & SONS, Limited,
Chesterfield.

DISPENSING BOTTLES

MEDICAL FLATS, VIALS, POISONS, &c.

Good Quality, Accurate Measure, at LOWEST PRICES.

Can be supplied WASHED and PAPERED or WASHED and CORKED ready for use.

Prompt Deliveries from Stock. *Estab.* 100 *years.*

I. ISAACS & CO.

NORTH LONDON GLASS BOTTLE COMPANY

London Office—106, MIDLAND ROAD, N.W 1
Warehouse and Stores—
L.M. & S. Rly Goods Depot, St. Pancras.
Telephone— Museum 4209. *Telegrams*— Isaclasbot, Kincross, London

INSURANCE?
THE PRUDENTIAL
OF COURSE!

LIFE, FIRE, ACCIDENT,
etc., etc.

"WARDWAY"

—the Wonder Chair for Invalids—has many patented features of great importance.

Please write for Booklet No. 8.

JOHN WARD
LTD.
249, TOTTENHAM CT. RD. - London, W.1.

ROYAL MAIL SERVICE TO

SOUTH AND EAST AFRICA

HOLIDAY TOURS
To MADEIRA or CANARIES
at reduced return fares

FORTNIGHTLY CRUISES
To ANTWERP, ROTTERDAM
HAMBURG and back

UNION-CASTLE LINE

HEAD OFFICE: 3, FENCHURCH ST., LONDON, E.C.3. WEST END AGENCY: 125, PALL MALL, S.W.1.

A Contribution
TO THE STUDY OF
CHOREA.
THE SYMPTOMS WHICH RESULT FROM INJURY OF THE CORPUS LUYSII.

BY J. PURDON MARTIN, M.D. BELF., M.R.C.P. LOND.,

ASSISTANT PHYSICIAN TO THE NATIONAL HOSPITAL FOR NERVOUS DISEASES, QUEEN-SQUARE; AND PHYSICIAN TO THE SEAMEN'S HOSPITAL, GREENWICH.

THE corpus Luysii, corpus subthalamicum or body of Luys, is an almond-shaped ganglion situated just below the optic thalamus (see Fig. 1); it lies immediately internal to the fibres of the pyramidal tract as they pass down from the internal capsule to the pes of the cerebral peduncle. Medial to it is the red nucleus and that complicated space known as Forel's field; below it is the substantia nigra. Its greatest length measures about 1·2 cm. The fibres which enter it come almost entirely from the lenticular nucleus, passing in considerable numbers across and around the internal capsule; of its efferent fibres some, as will be shown, descend into the mid-brain behind the substantia nigra, and a few cross under the floor of the third ventricle to the corpus Luysii of the other side. The knowledge of its connexions is still very incomplete. Of its functions I think it is fair to say that there has hitherto been no knowledge, although a few observers have drawn tentative conclusions from isolated cases.

In a paper read at the combined meeting of the American Neurological Association and the Neurological Section of the Royal Society of Medicine, held in London last July, a description was given of the following case, in which the only lesion found post mortem to which the symptoms observed during life could be ascribed was a small hæmorrhage destroying and practically limited to the body of Luys of the left side of the brain.

History of the Case.

The patient was admitted to the Seaman's Hospital under my care on Feb. 12th, 1927, and subsequently transferred to the National Hospital, Queen-square. He was a man of large build, aged 62, formerly a seaman, and latterly employed as a night watchman on board ships in dock. He had had no previous illnesses, but at the time he came under observation had very atheromatous arteries, his systolic blood pressure was 190 mm. Hg, and he had a considerably enlarged heart; the Wassermann reaction in his blood was positive.

Except for frequent headaches during the preceding six months, he had been well until Feb. 8th. On that morning, about 8 o'clock, just after arriving home from his night's work, he felt giddy, staggered, and had a severe pain in the right side of his body. He sat down for a little, then felt better, had a meal and went to bed as usual. When he woke up at 4 o'clock in the afternoon he tried to take a cup of tea sitting up in bed, but his right hand "shook" so violently that he spilled most of the tea and he could not bring his cup to his mouth. Even when his wife held the cup he could not drink normally, but, as his wife described it, "he slopped the tea into his mouth and gulped it down." When he got up that evening to go to his ship his right arm was twitching and swinging about widely, and "he was throwing his right leg about," but, with some assistance from his wife, he managed to walk. When his wife saw him again, two hours later, the involuntary movements had become much worse, but in the morning he managed to walk home. His condition remained much the same for the next 36 hours, but on the evening of Feb. 10th he became very agitated and unreasonable, turned on his wife as he had never done before, and in such a way that she was afraid of his violence; his involuntary movements were then worse than ever. The next day he remained in the same angry and uncontrollable mood, and in the evening made his way down to the ship. On the fourth morning after the onset of his illness he fell in his house, and that day he was brought to hospital.

Condition on Admission.

When I first saw him, and until his death 15 days later, his condition was as follows. While he was awake his right arm and leg were unceasingly tossed about in a violent chorea. The movements occurred at all the joints of these limbs, but an unusually severe involvement of the shoulder and hip and elbow and knee gave them an amplitude not often seen in chorea. In form they presented every combination of flexion, extension, and rotation; they were quite irregular. They were free, quick movements, unhampered by any degree of spasticity. Their violence was such that the skin had been knocked off the knuckles and other parts of the affected hand, and also of the inner sides of both knees. The movements were continuous during the waking state, though they varied somewhat in intensity, being less when the patient was alone, and worse when he was called up to answer questions or perform test movements. With a great effort the patient could hold the right arm steady for about 20 seconds, every muscle of the limb being then taut in contraction. The right side of the head and face and the tongue were involved in the chorea, and to some degree the right side of the trunk. The patient usually lay with his head and eyes turned to the right, and he seemed to try to put the right hand under his head in order with his head to fasten it down on the bed and so restrain its movements. The movements of the face were less than was to be expected from the severity of the chorea in the limbs. In the early days of the illness articulation, though affected, was still distinct, but later it became greatly slurred. Swallowing was performed by spasmodic gulps. Breathing was always irregular, and was sometimes difficult owing to the irregular movements of the muscles of the throat, chest, and abdomen. All these abnormal movements ceased entirely during sleep. The patient's facial expression suggested great anxiety and restrained anger, and this seemed to be a true reflection of his mental state; during his stay in hospital he was at times irrational and uncontrollable, especially towards night; in the latter part he was at times disorientated, and often in a frenzy. Associated with the movements was a moderate degree of sweating, almost confined to the affected side; the patient while awake always looked hot, and the jactitated limbs felt warm and moist. The body temperature, as registered on the chart, remained steadily at 97° F. until a few hours before death. The temperatures of the two sides of the body were unfortunately not compared.

Neurological Examination.

Further neurological examination revealed few other abnormalities. Voluntary power was normal in all the limbs. There was no sensory loss to pin-prick or light touch; at the first examination, but not subsequently, there seemed to be a slight hyperæsthesia of the choreic arm. The sense of position was normal, and pointing tests, including the Bránáy tests, were accurately performed; pointing with the right hand was accompanied by choreic deviations of the moving limb, and the point indicated was touched by a finger, as it were, in flight. The appreciation of vibration was normal. The tendon-jerks were present in both arms and about equal on the two sides, those in the right arm being, if anything, less; the knee-jerk was definitely less on the affected (right) side than on the left; the ankle-jerks were approximately equal. The plantar

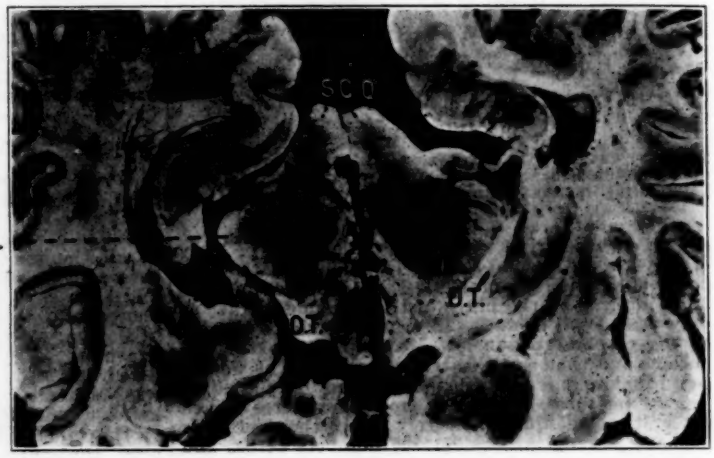
responses were both definitely flexor throughout the illness. The abdominal reflexes were not obtained. The optic discs were normal, the pupils were approximately equal, but neither was quite regular; both reacted to light, and as far as could be determined they reacted also to accommodation; the external ocular movements were full, but the eyes when at rest were usually deviated to the right. Except for the abnormal movements in the face, throat, and tongue, the functions of the remaining cranial nerves were normal.

The patient died on the twentieth day from the onset of the chorea. A post-mortem examination was performed by Dr. J. G. Greenfield 12 hours after death, and the brain was hardened for a week in 10 per cent. formol saline before being cut. Subsequent section showed a recent hæmorrhage destroying the body of Luys of the left side—i.e., of the opposite side of the body to the chorea; except for scattered hæmorrhagic points there was no other lesion in the brain.

The examination of serial microscopic sections showed that in its vertical extent and antero-posteriorly the injury corresponded closely with the limits of Luys's body, and in lateral extent it transgressed these limits only by one or two millimetres in each direction. A small dorsal fragment of the corpus Luysii remained. The red nucleus was not reached by the hæmorrhage at any level, and none of the known important fibre-tracts was interrupted.

The photograph which is shown here (Fig. 2) is that of a horizontal section of the brain, which passes on the left side through the lesion below its middle, and through the upper half of the red nucleus; the right half of the brain is cut appreciably lower (as is shown by the section of the optic tract), and only a small portion of the body of Luys of that side is seen. The actual area of destruction is seen surrounded by a zone of staining. Its length at this level was almost exactly 1 cm., and its breadth ½ cm., but at a higher level its breadth was slightly greater. A more detailed description of the pathological anatomy is given in the original paper.[1]

FIG. 2.



Horizontal section of the brain passing through the lower half of the hæmorrhage. The area of actual destruction is surrounded by a zone of staining. B.L. = body of Luys; R.N. = red nucleus; S.C.Q. = superior corpora quadrigemina; P. = cerebral peduncle; O.T. = optic tract; and L.V. = left ventricle.

FIG. 1.

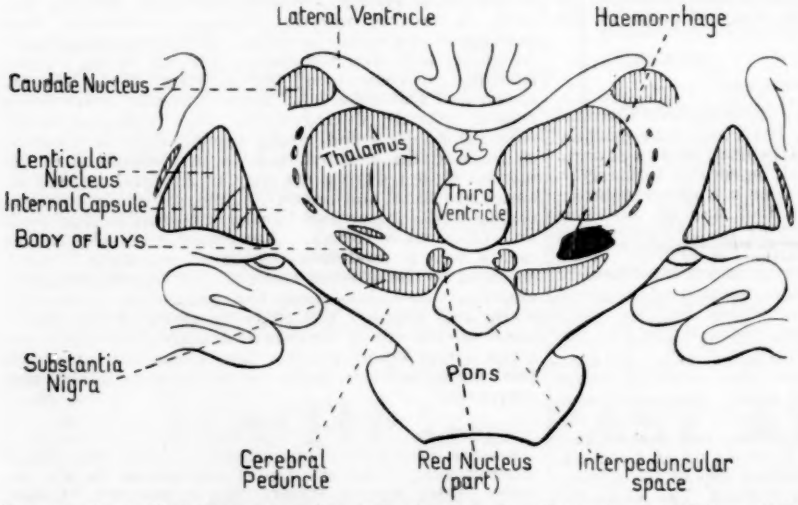


Diagram of a vertical transverse section of the brain to show the anatomical relations of the body of Luys and the extent of the hæmorrhage in the case described.

Similar Cases in the Literature.

It is impossible to assess the physiological significance of the findings in such a case except in conjunction with similar findings and with experimental work. There are in the literature of the last 50 years 12 cases, sufficiently described, in which localised lesions of the body of Luys have been found after death, and a number of other cases in which the body of Luys was involved in more extensive lesions. Closely comparable to the case described above are those of Fischer, Campora, Pette, Canfield and Putnam, Economo and Jakob, of which I give the following brief notes:—

Fischer, 1911.—Female, aged 72. Sudden onset of left hemichorea with very large movements; face considerably affected. Articulation and swallowing disturbed. No mental disturbance. Death on the fourth day.

At post-mortem examination a hæmorrhage was found destroying the right body of Luys "and only this." There was a superficial cortical defect on the orbital surfaces of both frontal lobes.

Campora, 1922.—Female, aged 70. Abrupt onset of violent chorea in the left side. Face involved; articulation and swallowing affected. Pronounced hypotonia of affected side. Some psychic disturbance. Death after five weeks.

At post-mortem examination a small hæmorrhagic fissure was found in the right subthalamic region, 1 cm. in length, running transversely above the pes pedunculi. It destroyed most of the corpus Luysii, leaving only its most lateral part intact; medially, it extended into Forel's field and just touched the capsule of the red nucleus; the internal capsule was not involved.

Pette, 1922.—Female, aged 69. Carcinoma of the breast three years before. Sudden onset of chorea of the whole of the left side. Death four weeks later.

Post-mortem examination showed a carcinomatous deposit the size of a pea in the right regio-subthalamica; the

body of Luys was mostly destroyed (private communication); red nucleus, thalamus, corpus striatum, and cerebellar peduncles all intact.

Canfield and Putnam, 1884.—Male, aged 59. Slight right hemichorea for several weeks, then sudden exacerbation. Face little involved. Articulation affected. No sensory loss. Knee-jerk and ankle-jerk normal on right, absent on left. The patient could walk without assistance. Death three weeks after the onset of severe chorea.

Post-mortem examination showed a hæmorrhagic softening the size of a large pea "in the medial half of the left crus, opposite the posterior portion of the thalamus; it involved the substantia nigra and the pes beneath to a depth of 5 to 6 mm., and the tegmentum above almost to the nucleus ruber. The only ganglionic matter involved besides the substantia nigra was the so-called ganglion of Luys."

v. Economo, 1910.—Male, aged 71. Sudden onset of violent chorea of the left side 24 hours after a slight stroke causing some weakness of this side. Articulation affected. Transient right hemi-amblyopia. Mental disturbance. Death seven days after the onset of the chorea.

Post-mortem examination revealed a hæmorrhage the size of a cherry-stone lateral to the red nucleus, in the substantia nigra and in the tegmentum, involving the regio subthalamica and the corpus Luysii, and extending ventrally into the pes.

Jakob, 1923.—Female, aged 75. Sudden onset of left hemichorea with large movements. Conjugate deviation of the eyes sometimes to right, sometimes to the left. Condition remained unchanged for three weeks; then 24 hours before death the patient became comatose and the limbs of the left side were at rest and very flaccid. On the right side some spasticity. Death from broncho-pneumonia on Nov. 3rd, 1921.

At post-mortem examination a recent hæmorrhage was seen, entirely destroying the body of Luys on the right side, and strictly confined to this ganglion, pushing Forel's bundles H 1 and H 2 upwards; it was sharply demarcated from the internal capsule and the substantia nigra. Medially, it extended beyond the bounds of Luys's body, but did not touch the red nucleus. Many hæmorrhagic points in the basal ganglia of both sides. Some small hæmorrhagic foci in the left internal capsule.

With these I think we may group the following case, though its anatomical description is not quite precise.

Magnan,[2] 1870.—Male, aged 73. Sudden onset of right hemichorea. Violent movements. Death after five days.

Post mortem "a section made through the left cerebral peduncle at its insertion into the optic thalamus revealed a hæmorrhagic focus of the size of a small nut." This was the only recent cerebral lesion.

Confirmatory evidence of the results of injury to the corpus Luysii is afforded by the remaining cases, in which there was more than one small lesion in the brain, one of the foci in each case destroying Luys's body.

Such cases have been recorded by Greiff, Touche, Bianchi (second case), Bremme and Matzdorff.[3] In all of these the clinical syndrome was the same as in the cases already described, with some complication corresponding to the other lesions. In Bremme's case the damage was caused by secondary carcinomata, in Bianchi's by patches of sclerosis, and in the other cases by hæmorrhage or thrombosis. Matzdorff's report requires special mention; it was apparently in the press at the time at which the paper I have referred to was read, and the author, citing seven of the cases I have mentioned, described independently as "The syndrome of the corpus Luysii" the main elements of the symptom-complex put forward under a similar title in my paper. But Matzdorff relates that his patient had been seen during life by Prof. Jakob, and the latter, who had had a similar case several years before, expressed the opinion (Wahrscheinlichkeitsdiagnose) that there was a lesion of the corpus Luysii of the opposite side of the body to the chorea. This must surely be the first case in which such a diagnosis has been correctly made, even tentatively, during life, and it marks a stage in the knowledge of the subject. Pathologically Matzdorff's case is important because the softening was entirely confined within the limits of Luys's body.

Of less physiological value than the foregoing, but still worthy of mention, are cases in which the corpus Luysii was involved in a lesion which extended widely beyond its borders. Such are Bianchi's first case (tuberculoma), and the cases of hæmorrhage recorded by Lewandowsky and Stadelman, and by Lloyd and Winkelman; probably the case recently described by Weil[4] falls also into this group. In all of these cases the same choreic syndrome was present during life.

To the experimenter the body of Luys is not easily accessible, and the only experiments actually involving it are those of d'Abundo.[5] He found that in kittens his lesions of the subthalamic region (including Luys's body) invariably produced a chorea of the opposite side of the body, and rotation of the head to the side of the chorea.

Fibres Descending from the Corpus Luysii.

It has been said that the efferent connexions of the corpus Luysii are very imperfectly known. In my case, blocks of cerebral tissue from above and below the site of injury were impregnated by the Marchi method, and these when cut showed a small but definite bundle of degenerated fibres beginning immediately caudal to the destroyed corpus and passing down the mid-brain (see Fig. 3). It lay immediately behind the substantia nigra, and soon

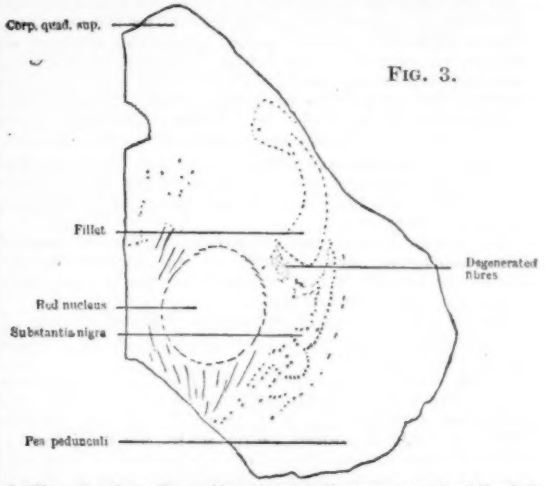


FIG. 3.

Outline drawing of a section through the upper part of the left half of the mid-brain to show the position of the degenerated fibres.

joined the medial margin of the medial fillet. It seems most probable that the fibres composing this bundle issue actually from the corpus Luysii, and it is consequently to be expected that a small lesion interrupting them would give rise to the same symptoms as an injury to the body of Luys itself. However that may be, there are in the literature of the last 50 years only two cases in which hemichorea was attributable to a focal lesion at a lower level than the corpus Luysii, and in both these cases the sites of damage, though widely divergent, were so situated that this bundle of fibres was interrupted. The first is a case by Bianchi in which the only damage in the left half of the brain (to account for a right hemichorea) was a patch of sclerosis which lay mainly in the middle third of the pes pedunculi and had spread backwards through the substantia nigra to involve the medial portion of the fillet. The second is a well-known case described by Bonhoeffer in which the main lesion was due to a carcinomatous mass at the decussation of the superior cerebellar peduncles, but to the left of this there was a small deposit interrupting the medial margin of the left fillet; the patient had had a right hemichorea. With the knowledge of the other cases now at our disposal it seems legitimate to ascribe the symptoms in this case to the latter lesion.

In animal experiments chorea of the opposite side of the body has been produced by Economo and Karplus[6] by lesions which interrupted, inter alia, the medial margin of the fillet, and by Lafora[7] by lesions directed towards the superior cerebellar peduncle, and therefore also interrupting these fibres. Chorea, as far as I have discovered, has not been obtained experimentally by any lesions other than those mentioned.

It is therefore in conformity with the clinical and experimental facts that interruption of the fibres which appear to descend from Luys's body gives rise to symptoms similar to those resulting from injury to the body itself. Unfortunately it has not been possible to follow the degenerated fibres to their termination, and their ending is unknown.

The Syndrome of Destruction of the Corpus Luysii or of its Descending Fibres.

A study of the foregoing cases in more detail than it is possible to give them here enables us provisionally to attribute a group of symptoms to the destruction of the corpus Luysii or interruption of its descending fibres, with the consequent release or disturbance of the function of other structures. The chief symptom is a violent chorea of the opposite side of the body, with unusual involvement of the shoulder and hip, and, therefore, with movements of unusual amplitude. The affection of the face, according to nearly all the descriptions, is less than one would expect from the amount of choreic movement in the limbs. Speech, swallowing, and respiration are all involved in the chorea. The movements cease entirely during sleep. The tendon-jerks of the affected side are usually less than those of the other, indicating a moderate degree of hypotonia.

In a number of cases it is recorded that the temperature of the choreic side was higher than that of the other half of the body, and in my case there was some unilateral sweating.

In nearly every case there has been a mental disturbance—at first chiefly an emotional change (excessive anxiety), and afterwards loss of memory, confusion, and disorientation.

There are no signs of pyramidal disease, no loss of superficial sensation or of sense of position, no defects in the pointing tests.

In all the recorded cases in which the syndrome was fully developed death has resulted in a few weeks, the maximum duration of life recorded after a sudden onset of violent chorea being eight weeks (Greiff). But with less severe symptoms the period of survival may be very much longer. In all the cases in which the mode of death can be ascertained, except Bonhoeffer's case in which death was due to erysipelas, the patients died of broncho-pneumonia. Touche's patient, who lived for a year after the onset of the chorea, had three attacks of broncho-pneumonia during that time. It is remarkable that none of the patients died of cerebral hæmorrhage or of cardiac failure. I think that the tendency to broncho-pneumonia is possibly to be correlated with the respiratory disturbances of the chorea and to be included as part of the fully expressed syndrome.

Remarks on the Pathogenesis of Chorea.

Since chorea commonly occurs in association with widespread inflammatory or degenerative changes in the brain, it has perhaps not been generally realised that it might result from a focal lesion. In this paper no reference is made to the inflammatory or degenerative choreas, but we must ask ourselves in what way focal lesions in the situations we have described can result in chorea. It is now generally conceded that chorea is a "release phenomenon," i.e. that it arises from the excessive or irregular activity of intact structures from which a controlling or guiding influence has been withdrawn. The cases that have been related do not indicate in what structures the impulses arise which originate the choreic movements, nor what structures must be intact in order that chorea may occur. Two factors indicate, however, that the impulses arise at a lower level than the body of Luys and that the controlling influence over them is normally exerted by the body of Luys itself. In the first place, we are dealing with a descending anatomical system of fibres; fibres arise in the lenticular nucleus and pass to the body of Luys, and another set of fibres arising in the body of Luys continues the path downwards to the mid-brain. Such a system must, by reason of its anatomical arrangement, exert its action downwards; in other words, the control which the destruction of Luys's body apparently interrupts is a downward-directed control, and so the impulses over which it is normally exerted must be arising at a lower level. Secondly, there is no valid evidence that focal injuries above the body of Luys result in chorea. Numerous animal experiments have been performed, of which those of Kinnier Wilson [8] on the lenticular nucleus and the recent series by Delmas-Marsalet [9] on the caudate may be mentioned, and in no instance has chorea or any symptom comparable to chorea resulted from a lesion of these structures. Of clinical cases of pure chorea resulting from focal lesions nearly all the recorded instances have already been mentioned. It is true that there remain four—those of Vogt,[10] Conos,[11] Austregesilo and Gallotti,[12] and Fragnito and Scarpini [13]—and that in all of these the chorea has been attributed to a lesion in the caudate or putamen. But it can be said without fear of contradiction that as a basis of argument the first three of these are valueless. The fourth is a much more important record, but is open to certain objections, and the authors, who express themselves with great reserve on its merits, state definitely that they are unwilling to give any general application to their findings. Consequently we must for the present be guided by the experimental evidence and assume that focal lesions of the caudate or lenticular nucleus do not give rise to chorea. If chorea does not occur unless the lesion is as low in the system as the corpus Luysii, and does occur when that structure is damaged, the control which normally prevents chorea must be exerted by the corpus Luysii itself. As long as that primary control is intact, chorea from a focal lesion does not seem to occur.

Physiological Action of the Corpus Luysii.

Of the physiological action of the corpus Luysii little can yet be said, except that it exerts a control over impulses arising in certain lower structures which are probably situated in the mid-brain. There is no unanimity as to the nature of the impulses which cause chorea, and until we know their nature we cannot deduce the normal function of the corpus Luysii from the symptoms liberated by its destruction. The anatomical connexions of the corpus Luysii with the lenticular nucleus suggest that there is a higher control of its activities represented in certain cells widespread in the striatum and pallidum, and it may be that by these nuclei the function of Luys's body is normally directed in relation with other cerebral functions.

References.

1. Martin, J. P.: Brain, 1927, l., 637. (References to most of the cases quoted are to be found at the end of this article.)
2. Magnan: Gaz. Méd. de Paris, 1870, 3me sér., xxv., 518.
3. Matzdorff, P.: Zeitsch. f. d. ges. Neur. u. Psych., 1927, cix., 538.
4. Weil, A.: Brain, 1928, li., 36.
5. D'Abundo, E.: Arb. a. d. Wiener Neurol. Institut, 1925, xxvii., 229.
6. Economo, C., and Karplus, J. P.: Archiv. f. Psych., 1909, xlvi., 275 and 377.
7. Lafora, G. R.: Libro en honor de Ramon y Cajal, Madrid, 1922, ii., 261.
8. Wilson, S. A. K.: Brain, 1913–14, xxxvi., 427.
9. Delmas-Marsalet, P.: Fonctions du Noyau Caudé, Bordeaux, 1925.
10. Vogt, C. and O.: Jour. f. Psych. u. Neur., 1920, xxv., 627.
11. Conos, B.: L'Encéphale, 1911, vi. (i.), 153.
12. Austregesilo, A., and Gallotti, O.: Rev. Neur., 1924, i., 41.
13. Fragnito, O., and Scarpini, V.: Rivista de Path. nerv. e ment., 1926, xxxi., 524.

A NOTTINGHAMSHIRE ORTHOPÆDIC HOSPITAL.—The Duke of Portland has given a large site at Harlow Wood, near Mansfield, for the erection of an orthopædic hospital. Owing to legal difficulties a public Guarantee Company has been formed for its erection. Last year, in Nottingham alone, there were more than 100 cripples for whom treatment was not available.

A CLINICAL STUDY OF THE HUMAN AND BOVINE TYPES OF TUBERCULOSIS IN MAN.

By JOHN T. MORRISON, M.B. EDIN., F.R.C.S. ENG.

HON. SURGEON, ROYAL SOUTHERN HOSPITAL, AND CONSULTING SURGEON, CITY SANATORIA FOR TUBERCULOSIS, LIVERPOOL.

THE investigations out of which this paper developed were originally undertaken by Prof. J. M. Beattie, of the University of Liverpool, to determine whether the incidence of human and bovine tuberculosis was the same in Liverpool as in other parts of the country. The bacteriological work has all been carried out by him from clinical material supplied from the City Sanatoria, the Royal Liverpool Children's Hospital, the Liverpool Stanley Hospital, and private practice. It is therefore fairly representative of all types of non-pulmonary tuberculosis and of various ages and social strata. The correlation of the clinical conditions with the bacteriological findings brought out many points of interest which are important in so far as they contribute to a more accurate knowledge of the disease. My conclusions should be regarded as indications rather than demonstrations of the truth. So far as they go, I think they are justified by ascertained facts, but larger numbers are needed before generalisations can be made. Of necessity a certain amount of selection has crept in. The material is from consecutive cases, but since, as a rule, it is the more hopeful cases that reach the operating-theatre the mortality results are of no absolute value. On the other hand, a certain amount of comparison between different groups is permissible.

One hundred cases were investigated bacteriologically during the years 1923–24–25. One or two have been excluded as certainly not tuberculous. Some patients cannot be traced, and so final conclusions cannot be drawn about them, although previous notes render them useful for certain statistics.

Inoculation Failures.

A considerable number of cases inoculated, although clinically undoubted cases of tuberculosis, gave no result in the test animals. Of these "negative" results one should be eliminated, as the patient had a severe streptococcal infection and the animals died of streptococcal septicæmia. This leaves 31 cases, almost one-third, for inquiry. The material used in these 31 cases was: in 66 per cent. the caseous debris of softening glands or actual pus; in 25 per cent. caseating bone foci; and peritoneal fluid and tuberculous granulation tissue in 4 per cent. each. As the proportions are practically identical in the series of cases proved definitely bovine, it seems that the source of the material and its physical properties have no important bearing on its failure to produce disease in animals. In other words, although pus was used in a considerable percentage of cases—and tuberculous pus is notoriously deficient in tubercle bacilli—the negative results cannot be attributed to this factor, as pus was used in just as many cases which gave positive results. So far as it goes, this is an argument against the criticism that paucity of organisms in the material used was responsible for the absence of tuberculosis in the laboratory animals.

It may be said that such organisms as were present were enfeebled by exposure to powerfully antagonistic bodies in the serum of patients highly immunised against tuberculosis. If this be so, the high state of immunity is not reflected in the clinical progress of the patients. In those under consideration the recovery-rate (or proportion of apparent cures) was only 73 per cent. None of the 18 cases of undoubted bovine tuberculosis traced for two years or over showed any signs of active disease—i.e., the recovery-rate was 100 per cent. I do not think that the effects of general immunity in the patient are of any great importance here. On the other hand, local conditions seem to have a bearing upon the results. It is conceivable that fibrosis, for instance, is inimical to the organisms in lesions in one part of the body, while in other parts the disease might even be progressive. The average duration of the lesion in the cases giving "no result" was 4·3 years (though several cases had apparently relatively short histories), while the "human" cases had lasted 2·3 years and the "bovines" only just over one year. That the results were not merely fortuitous is shown by the fact that repetition of the inoculations confirmed the original negative finding in several instances.

In case it should be pleaded that these patients were not tuberculous at all, those in whom any clinical doubt arose have been excluded. The proportion of cases of actinomycosis and syphilis which simulate tuberculosis is very small. No case giving a positive Wassermann reaction has been included. The table shows that, in the distribution of the disease over the different organs and systems, the "no result" cases represent almost exactly the average between those of definitely human and bovine origin. The negative cases, therefore, are probably derived fairly equally from both types of infections, so that it cannot be said that one type of bacillus is more frequently at fault, or is more easily influenced by the local curative actions of the body, than the other. For this reason the "no result" cases have been ignored in the statistical inquiries into the human and bovine cases.

—	Bovine.	Human.	No result.
Lymph glands	25	11	20
Bones and joints	5	13	7
Abdomen	2	0	2
Genito-urinary	1	1	0
Miscellaneous	1	1	1

Regional Distribution.

The bovine bacillus is found to account for 75 per cent. of the cases of tuberculous glands in the neck. That is rather less than has been found in certain other districts, where the percentage has been placed as high as 90 per cent.[1] Inquiry into the age incidence may account for this apparent variation. Bovine infections were present in only about 28 per cent. of the bone cases. The figures relating to abdominal and genito-urinary cases—mainly because they are relatively seldom submitted to operation—are so small as to be valueless. In the main the figures are comparable to those for the country generally.

A study of the age factor throughout the whole series shows that 65 per cent. of the human infections were over 12 at the age of apparent onset, while 35 per cent. were 20 or over when symptoms first appeared. Among the bovine cases, on the other hand, only 15 per cent. were over 12 when attention was drawn to the disease. Of these 15 per cent., although the infection was bovine, three out of the five were not only over 12 but actually between 20 and 25 when evidence of tuberculosis was first obtained. While, roughly, 75 per cent. of all bone tuberculosis is due to the human bacillus, in patients over 15 the figure rises to 82 per cent., and in those under 15 about 70 per cent. is human in origin. This figure is one of great significance.

Of the cases of lymphatic gland infection in children 16 per cent. yielded the human type of organism and 84 per cent. the bovine. This more closely approximates to the 90 per cent. quoted above from the published results of work done entirely amongst children. Nevertheless, the fact remains that in Liverpool 16 per cent. of cases of glandular tuberculosis are due to human bacilli—i.e., infection from active cases of phthisis. In contrast to this 62 per cent.

[1] A. P. Mitchell: Infection of Children with Bovine Tubercle Bacillus, Brit. Med. Jour., 1914, i., 125.

of glandular disease in adults is due to the human tubercle bacillus. In fact, in adults about 72 per cent. of all surgical tuberculosis is the result of infection with the human organism. That implies that a very large proportion of cases of adult non-pulmonary tuberculosis have also a pulmonary focus—active or latent. This should increase the gravity of the prognosis in these cases, should make prolonged after-care imperative, and should be a warning against the indiscriminate use of general anæsthetics, which may aggravate pulmonary disease. An X ray of the chest should always be taken before operation on any adult with surgical tuberculosis.

Family History.

It was thought that a study of the family history would in many instances give a clue to the type of disease present—i.e., that a history of phthisis in a member of the older generation would be found in infections with the human bacillus, and that in bovine infections the older generation would be healthy, and other members of the same generation diseased. Here, however, great difficulties are encountered. There is a very widespread feeling that it is disgraceful to have a case of tuberculosis in the family. Unfortunately, the sense of disgrace does not lead to the general adoption of a more hygienic way of life, the use of non-tuberculous milk, and stricter measures to prevent the spread of infection, but only to concealing the shameful fact or to heaping up mounds of sand in which to bury the head, so that at least the horrid thing is out of sight. Infection of collateral members of the family is surprisingly seldom reported in bovine infections, though, of course, striking instances do occur. This is another indication that the soil is at least as important as the seed in the development of tuberculosis. In human cases, on the contrary, a bad or decidedly suspicious history of pulmonary disease was found in 31 per cent. Over and over again one can elicit nothing more than "grandmother always had a cough and mother died of pneumonia."

Apart from a study of the family history, attempts at determining the portal of entry were singularly unsuccessful. It was definitely recorded that, among the bovine cases, two apparently originated in glands draining the area in which an open wound had existed a short time before. In bovine cases the milk naturally falls under special suspicion. In four cases, one of which was in a well-to-do intelligent family, it was stated that the milk had always been boiled. This, of course, proves nothing, for such matters are often left to maids, who may be untrustworthy. Moreover, other articles of diet, such as butter and cream, may be carriers of the bacillus. The tonsils were diseased and the teeth carious in many patients with cervical glandular disease, but in several others they were not obviously at fault. Little weight, unfortunately, can be attached to this observation as, apart from the possibility of tuberculous infection passing through a tonsil without leaving indisputable evidence behind, it has been definitely shown that naked-eye examination is no criterion as to the presence or absence of actual tuberculous disease in a tonsil.[1]

Results of Treatment.

The results of treatment are strikingly different in the different groups. For instance, as already stated, all the 18 bovine cases traced were found in good health, and their lesions quiescent, while no less than 18·75 per cent. of the human cases were dead within three years; 68·75 per cent. were cured or apparently cured. I do not think this necessarily means that the bovine infections are harmless, while the human are deadly. Apart from the long period of illness, the expense of treatment, and the permanent crippling often caused by bovine infections, many patients die in the early years of life from meningeal, pulmonary, and abdominal tuberculosis, and are never seen by the surgeon.[2] The course of the two infections is apparently very different. Those due to the bovine organism begin, as a rule, early in life, though not necessarily in the very earliest years, and may lead to a comparatively acute and virulent process. Should this not prove fatal, the manifestations of the disease become more and more chronic until after early adult life it practically disappears. Many believe that the human infection is contracted early—i.e., within the first four years of life—and that thereafter, if not rapidly fatal, it lies latent, perhaps for many years. Be that as it may, in "surgical cases" the disease is one that tends to attack those of maturer years (65 per cent. over 12 at the time of apparent onset) and, unlike the bovine type, it never disappears, and all ages are liable to suffer. It may become very chronic, but the immunity established evidently falls far short of that produced by the bovine organism, as is shown by the very considerable mortality in the human variety.

[1] Dr. Louis Cobbett's evidence, Report of Royal Commission on Tuberculosis, 1907.

SOURCES OF INFECTION IN NON-PULMONARY TUBERCULOSIS.

By C. O. STALLYBRASS, M.D. Lond., D.P.H. Liverp.,
ASSISTANT MEDICAL OFFICER OF HEALTH FOR THE CITY OF LIVERPOOL.

For the past seven years I have noted, from the reports of our sanitary inspectors on cases of non-pulmonary tuberculosis, whether there was a history of exposure of the patient to a pulmonary case occurring in the patient's family. In all these patients there is a considerable presumption that the infection was of human origin. The total number of cases so examined is now 4469, and these are presented in Table I., separated according to the anatomical site, on the usual classification. The numbers are sufficiently large to have some statistical validity.

TABLE I.

City of Liverpool.—Cases of non-pulmonary tuberculosis in 1921–27, divided into Group A—those with *no* history of exposure, and Group B—those with a history of exposure to open cases of tuberculosis occurring within the family of the patient.

Site of disease.	A.—No exposure.	B.—Exposure.	Proportion of total expressed per cent.		Difference of per-centage.*	Probable error of difference (per cent.).
			A.	B.		
Bones and joints ..	974	89	24·3	19·3	−5·0	±0·41
Abdominal	859	116	21·4	25·1	+3·7	±0·45
Peripheral glands ..	1277	156	31·9	33·8	+1·9	±0·49
Meninges and brain	418	61	10·4	13·2	+2·8	±0·39
Skin..	124	15	3·1	3·2	+0·1	±0·80
Urinogenital ..	92	3	2·3	0·7	−1·6	±0·97
Other, or ill-defined	264	21	6·5	4·6	−1·9	±0·32
Total	4008	461	99·9	99·9	—	—

* This column gives the excess (or defect) of the percentage of cases occurring in Group B over the percentage of cases occurring in Group A.

The significance of these figures lies in the last two columns, which give (1) the excess or deficiency of the percentage of cases having a history of exposure to infection in comparison with the percentage of cases having no such history, and (2) the probable error of this difference in percentage. The usual criterion of the significance of a difference of two rates is that it should be three or more times its probable error. With this proviso the following deductions may be made from the table. In Liverpool—

1. Tuberculosis of the bones and joints is significantly more frequent in those having no history of exposure to a human source of infection.

2. Tuberculosis of meninges and abdominal tuberculosis are significantly more frequent in those having a history of exposure.

3. Tuberculosis of peripheral glands is significantly in excess in those known to be exposed to human infection, but the significance is not so high as in 1 and 2.

4. The other groups either lack precision or are not numerous enough to be significant.

The deductions from these figures indicate that tuberculosis of bones and joints is more often of bovine origin than meningeal, abdominal, or, with less certainty, peripheral glandular tuberculosis. This inference is somewhat contrary to the usual opinions which are based largely on the work of Eastwood and Griffith, and of Park and Krumwiede. Griffith has given figures of cases bacteriologically investigated; they indicate that 46·5 per cent. of cervical glandular cases, 41·3 per cent. of abdominal cases, and 18·3 per cent. of bone and joint cases occurring in children were caused by bovine bacilli.

I give now a table (II.) of non-pulmonary cases of tuberculosis, slightly modified from figures given by Dr. A. S. Griffith at the National Milk Conference in London in 1922. I have computed the probable errors of the percentage.

TABLE II.*

—	Cases.	Bovine and per cent.	Probable error.
Cervical glands	116	54 (46·5)	±3·12
Bone and joint	476	87 (18·3)	±1·20
Lupus	126	64 (50·8)	±3·00
Genito-urinary	17	3 (17·6)	±6·23
Post-mortem material ..	159	39 (24·5)	±2·30
Meningitis	12	2 (16·6)	±7·25
Total	906	249 (25·8)	±0·95

* These figures, unfortunately, do not give the abdominal cases.

Owing to their numerical insufficiency the figures of bacteriological examination of material from cases of non-pulmonary tuberculosis are not beyond statistical criticism, despite the immense labour involved in obtaining them. Mr. E. D. Rudolf[1] performed this task some years ago, and his results are given in Table III.

TABLE III.

Age-period in years.	Total cases.	Bovine infections and per cent.	Maximum variation possible.
0–5	47	14 (29·79)	18·87
5–10	108	31 (28·71)	12·31
10–16	62	7 (11·29)	11·37
16–25	15	3 (20·0)	29·2
Over 25	29	0 (0·0)	0·0
Total	261	55	—

It appears from these figures that the number of cases occurring in persons over 16 years of age is insufficient for comparison, and the figures in this respect are not a fair sample of the population. In order, then, to make a useful comparison it is necessary to confine attention to children. The figures given in Table IV., from information provided by Dr. B. T. J. Glover, show the distribution into adults (over 15 years) and children, of 2625 cases on the records of the tuberculosis dispensaries in 1927, and are probably a fair sample of the whole.

TABLE IV.

Cases of non-pulmonary tuberculosis among persons on records of tuberculosis dispensaries in Liverpool, 1921–27.

Classification.	Adults and per cent.	Children and per cent.	Total.	Children. Per cent. of total at site.
Bones and joints	277 (36·40)	469 (25·16)	746	72·6
Abdominal ..	83 (10·91)	471 (25·27)	554	85·0
Peripheral glands	314 (41·26)	764 (40·99)	1078	70·9
Other	87 (11·43)	160 (8·58)	247	64·8
Total	761 (100·00)	1864 (100·00)	2625	71·1

[1] THE LANCET, 1922, i., 1146.

The incidence upon adults and children is not markedly different except in the case of abdominal tuberculosis, which is predominantly a disease of children, and to a lesser degree in respect of bone and joint tuberculosis which has a somewhat disproportionate incidence upon adults. I therefore returned to my records and abstracted the cases with a history of exposure, dividing them into adults and children. The result is shown in Table V.

TABLE V.

Cases with a history of contact with a pulmonary case.

Classification.	Adults and per cent.	Children and per cent.	Total.	Ratio of children to adults (per cent.).
Bones and joints	24 (22·64)	65 (18·31)	89	2·7
Abdominal ..	10 (9·48)	106 (29·86)	116	10·6
Peripheral glands	51 (48·11)	105 (29·58)	156	2·0
Other	21 (19·81)	79 (22·25)	97	2·8
Total	106 (99·99)	355 (100·00)	458	3·31

It would take too long to find the proportion of children in all the cases of non-pulmonary tuberculosis, and so I take the records of the tuberculosis institutes, in which the children amount to 2625 out of 4469, or more than half the total, and, with this proportion as a basis, eliminate from the total given in Table I. the proportion which may be regarded as probably adults (Table VI.).

TABLE VI.

Estimated cases of non-pulmonary tuberculosis *in children* in the City of Liverpool during 1921–27, divided into (A) those with *no* history of exposure, and (B) those with a history of exposure to a pulmonary case of tuberculosis.

Site of disease.	A.—No exposure.	B.—Exposure.	Proportion of total expressed per cent. A.	Proportion of total expressed per cent. B.	Difference of percentage.*	Probable error of difference (per cent.).
Bones and joints ..	772	65	24·18 ±1·01	18·31 ±1·38	−5·87	±1·71
Abdominal	829	106	25·97 ±1·05	29·86 ±1·64	+3·89	±1·95
Peripheral glands ..	945	105	29·60 ±1·09	29·58 ±1·63	−0·02	±1·96
Other, or ill-defined	646	79	20·24 ±0·96	22·25 ±1·49	+1·01	±1·77
Total	3192	355	99·99	100·00	—	—

The deductions from Table I. have to be somewhat modified for children:—

1. Bone and joint tuberculosis is significantly in excess in those having *no* history of exposure to human infection.

2. Abdominal tuberculosis is in slight excess in those having a history of exposure.

3. Peripheral glandular tuberculosis occurs with as high a frequency among those exposed as among those not known to be exposed to human infection.

There is therefore a direct contradiction between the figures I now publish and the results of bacteriological investigation. Possibly the discrepancy arises from differences in the age-distributions of the populations investigated; or there may be geographical differences; or the cases bacteriologically investigated may be representative of only a portion of the whole—e.g., the more severe cases.

It is of some interest to note that, although the collection of the data has occupied seven years, their analysis has taken only two days; yet it is this comparatively slight labour which is usually shirked. Use has been made of Pearson's tables for the value

of χ, Miner's tables of $\sqrt{pq}$, Barlow's tables of squares, and a calculating machine for the multiplication and division.

I have to express my thanks to Dr. A. A. Mussen, Medical Officer of Health for the City of Liverpool, for permission to publish these figures.

THE PERMANENCE OF THE SCHICK NEGATIVE STATE.

By H. J. PARISH, M.D., M.R.C.P. Edin.,
AND
C. C. OKELL, *M.C.*, M.B., M.R.C.P. Lond.

(*From the Wellcome Physiological Research Laboratories, Beckenham.*)

It is customary to assume that the state of immunity to diphtheria which is indicated by a negative Schick test is permanent. This is suggested by much experimental work on the duration of active immunity, but, because modern methods of diphtheria prevention are of such recent date, it is impossible to examine the expectation by actual experience in human beings. This paper records the results of retesting children at intervals after a negative Schick test was obtained, the maximum interval being seven years. An investigation has also been made of the capacity of response to artificial immunisation of any who may have become positive after having once been negative. 973 children were retested one to seven years after the first negative Schick test. All were negative with the exception of 28 (2·9 per cent.). 541 children were retested after one to three years, 191 after three to five years, and 241 after five to seven years. After one to three years the percentage of positives was 2·6, after three to five years 5·3, and after five to seven years 1·7, differences which are probably not significant.

The 973 children may be subdivided into two groups—viz., 533, who were negative to the original Schick test one to seven years previously, and 440, who were positive on the original Schick test and became negative only after injections of prophylactic mixtures (vide table). 527 children (98·9 per cent.) of the 533 who were negative on the original Schick test one to seven years previously were read as negative on retest, and 6 (1·1 per cent.) as positive. 418 (95 per cent.) of the 440 in the immunised group were negative on retest and 22 (5 per cent.) were positive. It will be seen that there is little difference in the Schick-positive rate of the two groups. Further tests may, however, confirm the observation that children who have been immunised by artificial methods show a somewhat higher percentage of positives on retest than those who have become immune in response to the weaker stimuli which they may receive naturally. It may be possible that some individuals can be immunised only by the larger stimuli introduced in prophylactic mixtures, and that these people are prone to lose some of the antitoxin they may thus with difficulty acquire. One or two individuals who gave faint reactions may have been wrongly read as positive in our recent retesting, but it is better to read as positive one or two doubtful reactors who are really immune than to pass as Schick-negative a susceptible subject. The Schick level of immunity corresponds to about 1/100th to 1/30th of a unit of antitoxin per c.cm. of blood. The Schick-negative reactor contains more than this amount and the Schick-positive reactor less.

Group 1.—533 Children Negative on Original Test.

In six children who were originally Schick-negative one to seven years previously a positive Schick result was obtained, indicating a quantity of antitoxin less than 1/50th of a unit per c.cm., but four of the six became negative within a brief interval of the Schick test injection. Thus, two weeks after the Schick test was made, a blood sample from one child was examined and found to contain half a unit per c.cm. Blood samples from two other children contained 1/10th unit of antitoxin per c.cm. within one week of the Schick injection, and a fourth child had 1/100th unit in two weeks and gave a Schick-negative reaction in three weeks. Only 2 (0·4 per cent.) of the children (italics in table) required an injection of an immunising mixture. One had no detectable antitoxin in seven days, was given an immunising injection of toxoid-antitoxin at 14 days, had 1/100th unit at 21 days, and was definitely negative a fortnight later. The other gave a positive reaction to a second re-Schick one week after the first, had less than 1/1000th unit of antitoxin, and was given 1·0 c.cm. of an immunising mixture after two weeks and had 1/250th unit of antitoxin in four weeks. This child has recently had another 1·0 c.cm. dose of a prophylactic mixture and is still under observation.

The first four cases afford a parallel to the experiments of Glenny and Allen (1922) on rabbits and guinea-pigs; they found that even 1/20th of a Schick test dose might act as a "secondary stimulus" (Glenny and Sudmersen, 1921), causing a rapid production of antitoxin in an animal which had once been actively immune but which had subsequently lost some or all of its circulating antitoxin. The present investigations have amply confirmed Glenny's observations, and there is no room for doubt that such a small amount of toxin as 1/50th of the guinea-pig minimal lethal dose has a pronounced influence on the amount of circulating antitoxin actively produced, even of such a large animal as a human being. This point has already been discussed by O'Brien (1926), who instanced six cases in which a Schick test dose produced a demonstrable rise in antitoxin in actively immune subjects. Similar observations have been made by Kellogg and Stevens (1927).

Group 2.—440 Children Positive on Original Test and Negative immediately after Immunisation.

Twenty-two children (5 per cent.) in this group were positive on retest one to seven years later, but, as in the first series, all but 2 (0·4 per cent.) developed antitoxin rapidly in response to the stimuli of Schick injections. It will be seen from the table that five of the children were still positive or partially positive on a second re-Schick in the second or third weeks, but one week later all five had 1/25th to 1/5th unit of antitoxin. Two reactors who were more refractory (italics in table) were a brother and sister at a poor-law institution who had been very difficult to immunise in 1925. They had both required two courses of diphtheria prophylactic mixture—six injections of 1·0 c.cm. in all—but were, we think, undoubtedly Schick-negative finally, the boy within two months and the girl within four months of the last immunising injection. We are confident that the toxin dilutions with which these tests were made were of satisfactory potency on both occasions. On retest three years later both children were positive, and after one week and four weeks had no detectable antitoxin in the blood (i.e., less than 1/2000th unit per c.cm.). Schick tests in the first and fourth weeks were also positive. In the fifth week they were given 1 c.cm. of toxoid-antitoxin mixture. Two weeks later the boy had 1/25th unit of antitoxin, indicating a fairly brisk response, but his sister still remained refractory and is receiving further injections.

Discussion.

It will be seen that there is very little difference between the two groups, which can now be considered together for purposes of discussion. At first sight the percentage of children who had reverted to the Schick-positive state after having once been negative is disquieting; 28 children (2·9 per cent.) of 973 who had been read as negative one to seven years previously were regarded as positive on retest. It is, however, reassuring that only four children (0·4 per cent.) required immunising injections, and that three of the four showed a marked rise in antitoxin within one to three weeks of a single dose of prophylactic mixture. It is doubtful, therefore, if the immunising mechanism of these children would really have been sluggish vis-à-vis an average infecting dose of virulent organisms. The fourth child (0·1 per cent. of the entire series) is in a different category, for she failed to show the slightest response to an injection of 1·0 c.cm. of toxoid-antitoxin mixture.

The efficiency of the Schick dose of toxin as a "secondary stimulus" is remarkable. It is a very small amount of toxin, originally founded on 1/50th of the guinea-pig minimum lethal dose, and in combining power is equivalent to 1/1000th of a unit

of antitoxin. If, however, a Schick-negative reactor has lost some of his antitoxin and becomes Schick-positive, with little or no detectable antitoxin, the Schick dose of toxin may be sufficient to make him once again Schick-negative. In other words, active immunity with the capacity for responding to a fresh stimulus has remained, although circulating antitoxin may have been lost. The fact that a Schick dose of toxin may be capable of stimulating the production of circulating antitoxin in an actively immune subject must be borne in mind in connexion with every type of experiment, in animals as well as in human beings, in which serial Schick tests are used for the study of changes in immunity.

Over and above the series under review we have retested a group of 194 children who were negative on the original test three months previously. All were negative on retest.

The observations, so far as they go, while not completely establishing the dictum "once Schick-negative, always Schick-negative," support the more general statement "once immune, always immune," if by immunity we imply a more ready protective response to the invasion of the specific toxin. One would expect such a "potential" immunity to be sufficient to protect an individual against any serious infection by the diphtheria bacillus.

Tests on 973 Children.

After 1–7 years: re-Schick.			Weeks after re-Schick.					
			1	*2*	*3*	*4*	*5*	*7*
533 children negative on original Schick test.	−527 (98·9%)	1	..	1/2*	..	..	..	..
		2	1/10	..	..	..	..	..
	±6 (1·1%)	1	..	1/100	..	..	..	..
		1	*Nil*	*M*	*1/100*	..	..	..
		1	+	*1/1000*	..	*1/250*	*(a)*	..
				M	..	..	..	..
440 children positive on original Schick test and negative immediately after immunisation.	−418 (95·0%)	2	1/2	..	..	..	..	..
		1	1/50	1/25	1	..	..	..
		2	1/100	..	..	1/25	..	..
		1	1/100	−	..	..	..	..
		1	..	1/100	−	..	..	..
		2	..	1/100	±	1/25	..	..
		2	1/250	1/50	..	..	..	..
		1	1/250	..	−	..	..	..
		1	..	1/250	1/5	..	..	..
	+22 (5·0%)		..	+	..	..	..	..
		1	1/500	..	..	1/50	..	..
		2	..	1/750	1/5	..	..	..
			..	+	..	..	..	..
		1	1/1000	..	−	1/25	..	..
		1	−	..	..	..	..	..
		2	+	−	..	..	..	..
		1	*Nil*	..	..	*Nil*	*M*	*1/25*
			+			+		
		1	*Nil*	..	..	*Nil*	*M*	*Nil*
			+	..	..	+	..	*(a)*

* = Half a unit of antitoxin per c.cm. of patient's blood.
(a) Further details incomplete.
M = Toxoid antitoxin mixture – 1·0 c.cm.
+, ±, −, = Reaction to Schick test.

Summary.

(1) 533 children who were Schick-negative on the original test were retested one to seven years later, and showed a 1·1 per cent. Schick-positive rate.

(2) 440 children who were Schick-positive on the original test were rendered Schick-negative by immunisation. When retested one to seven years later 5 per cent. were found to be positive.

(3) In both these groups nearly all the "relapsed" Schick-positive individuals rapidly produced circulating antitoxin in response to very small amounts of diphtheria toxin, and could be considered as in a state of active immunity.

We have to thank Mr. A. T. Glenny for valuable help and advice as well as for the numerous blood titrations which he has kindly done for us.

References.—Glenny, A. T., and Allen, K.: Jour. Hygiene, 1922, xxi., 104. Glenny, A. T., and Sudmersen, H. J.: Ibid., 1921, xx., 176. Kellogg, W. H., and Stevens, I. M.: Jour. Amer. Med. Assoc., 1927, lxxxix., 273. O'Brien, R. A.: Jour. Path. and Bact., 1926, xxix., 320.

THE SCREENED RADON SEED IN THE TREATMENT OF MALIGNANT DISEASE.

By PHILIP GOSSE, M.D. Durh.,
DEPUTY MEDICAL SUPERINTENDENT OF THE RADIUM INSTITUTE, LONDON;
AND
F. E. CHESTER-WILLIAMS, M.R.C.S. Eng.,
RESIDENT MEDICAL OFFICER OF THE INSTITUTE.

For many years attempts have been made to treat tumours by implanting into them small pieces of capillary glass tubing containing radium emanation, but the results of such treatment have been unsatisfactory owing to the necrosis induced by this method, the glass capsule allowing the very destructive β rays to pass into the surrounding tissues.

The use of a capillary seed enclosed in a metal case having attached to it a fine thread has only recently been adopted in this country, though the method has been extensively used in America, particularly by Dr. Joseph Muir, of New York. No statistics of value can yet be given from a series of patients treated with seeds at the Radium Institute, London, but the results which are being obtained are encouraging, more especially in those cases which past experience has shown respond poorly to other forms of radium therapy. The object of this paper is to indicate the type of case most likely to derive benefit from this particular method of radiation and to give a brief description of the apparatus employed at this Institute.

Apparatus.—The seeds are cylindrical shells of platinum tapered at both ends, encasing a piece of capillary glass tubing containing radium emanation. Each seed is 6 mm. long and 1·1 mm. in diameter, having a wall of 0·3 mm. of platinum. Attached to the seed is a fine black thread which serves the dual purpose of marking the position of the seed in the tumour and facilitating its removal when the required dose has been given.

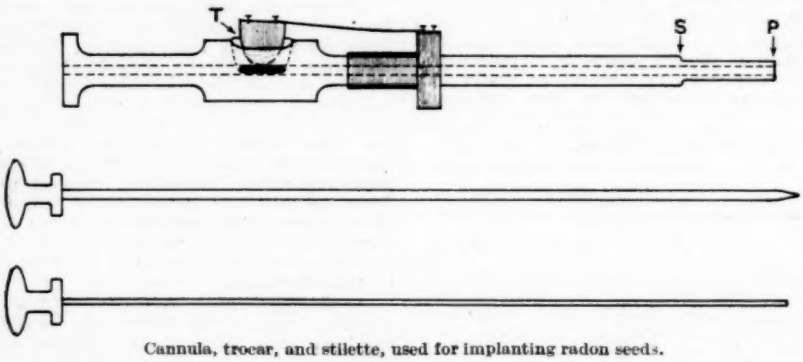
Dosage.—The majority of the patients have been treated with seeds each containing 1·5 millicuries of radon at the time of implanting, giving 200 millicurie hours of radiation if left in the tumour 14 days, by which time its radio-activity is negligible. The platinum screen 0·3 mm. in thickness allows about 90 per cent. of the gamma rays to pass through with less than 5 per cent. of beta rays.

Technique.—A trocar, with a special cannula as shown in the diagram, is used for implanting the seeds. The instrument having been loaded with a seed through the slot T it is inserted into the tumour up to the shoulder S. On withdrawal of the trocar the seed is forced into the lumen of the cannula by the spring and may then be pushed into the tissues with the stilette. It is a point of importance that the use of "introducers" with known but varying lengths from point P to shoulder S, enables the operator to plant seeds at known depths from the surface. As a general rule the seeds in a tumour should be about 2 cm. apart. Seeds may be implanted into tumours of the bladder through an operating cystoscope, using flexible introducers, and special instruments have been devised for use through the œsophagoscope and the proctoscope.

After-treatment.—The threads of seeds introduced anywhere in the buccal cavity may be bunched together, brought out through the mouth, and fixed to the skin of the cheek with adhesive plaster. Experience has shown, however, that patients tolerate the presence of the threads better if they are cut short ($\frac{1}{2}$ inch) and left free. While it is customary to remove the seed by gentle traction on the attached thread when its period of activity is over, no ill-effects have been noted in cases where the seeds have been left permanently in the tissues.

Advantages of the Method.

The advantages of seeds over other forms of radium applicators are: 1. By suitable spacing of the seeds throughout the whole tumour a uniform radiation is obtained. 2. The seeds are easily introduced and can be accurately placed in position. 3. Owing to their small size they are retained at the required site. This is of particular advantage in regions where the soft tissues are scanty—e.g., the alveolar margin. 4. Screened seeds without threads may be used in the treatment of tumours from which the recovery of radium needles would be difficult. 5. Patients are not confined to bed throughout treatment, but are able to attend as out-patients for regular examination. 6. Some hours after the insertion of radium needles into tumours of the tongue, for example, it is a common experience to find the heads of the needles becoming exposed, however completely they may have been buried at the time of operation. This is probably due in part to the movement of the tongue and in part to the traction of the heavy silk threads attached. Burns of the mucous membrane of the buccal cavity are likely to result unless special shields covering the alveolar margins and cheeks are employed. Seeds by remaining completely embedded in the tissues minimise the risk of burns and make the use of the cumbersome screens unnecessary. 7. Trauma is minimised, the seed causing little damage to the tissues both at the time of insertion and removal, owing to its size and shape. This is an important factor when dealing with malignant disease.



Cannula, trocar, and stilette, used for implanting radon seeds.

Types of Cases most Suitable for Seed Treatment.

While most malignant tumours may be treated as satisfactorily with seeds as with other forms of apparatus, their use at the Radium Institute has been confined to tumours which, owing to their position, would not receive uniform radiation by other methods.

These may be divided into two main groups. In the first are placed tumours where the retention of radium needles is difficult owing to the constant and unavoidable movement of the structures or to the small amount of soft tissue present. Examples of such tumours are those of the palate, the floor of the mouth, gums, frænum of the tongue, mucous membrane lining the cheek, tonsil, larynx, and pyriform fossa. Into regions such as these it was customary to insert comparatively large doses of radium to act for a short time. This method gave non-uniform radiation, sometimes followed by severe reaction and sloughing. Seed treatment of such patients gives them the triple advantage of a minimum of discomfort, uniform radiation, and a comparatively small dose of radium acting over a period of many days.

Into the second group may be placed tumours whose inaccessibility makes both the inserting and recovering of radium needles a difficult and frequently hazardous undertaking. It is unnecessary to give a list of these tumours which would include such commonly occurring ones as carcinoma of the œsophagus, stomach, prostate, rectum, and bladder. By employing suitable introducers radon seeds may be implanted into most of these, thus ensuring their complete radiation.

Mention must also be made of the suitability of seeds for the treatment of small malignant nodules. The small size of the seed enables it to be completely embedded at the site required. Needles inserted into such nodules frequently cause damage to the surrounding tissues which receive rays from the projecting ends, while small surface applicators are unlikely to remain in the required position for prolonged periods.

While this paper has been devoted to the description of treatment with seeds alone, we have frequently found them of use in conjunction with other forms of radium apparatus.

Illustrative Cases.

The following cases, in which the diagnosis has been confirmed by section, illustrate the results which are being obtained after treatment of the primary lesion with radon seeds.

CASE 1.—*Surface epithelioma*, with little surrounding healthy tissue. Male, aged 61. Treated June 19th, 1928. Fungating epithelioma of the right ear, 3·0 cm. in diameter, growing for two years. Four seeds were inserted into the tumour and left there for six days. Present condition: tumour no longer present, ulcer healed.

CASE 2. *Carcinoma; floor of mouth.*—Male, aged 59. Treated in May, 1928. Patient had a malignant ulcer of the floor of the mouth, which had been noticed for about three months. The ulcer, which had hard edges, extended from the mid-line, backwards beneath the tongue on the left side for about 4 cm. Ten seeds were inserted and allowed to remain for seven days. Present condition: ulcer is completely healed. Movements of the tongue are free.

CASE 3. *Carcinoma of alveolar margin.*—Male, aged 70. Treated January, 1928. Patient had been unable to wear his lower denture during the latter part of 1927. He was found to have a hard, coarsely papillated carcinoma on the alveolar margin of the right lower jaw. Four seeds were inserted for 14 days. On examination in March active disease was noted at each end of the area treated on his first attendance. Four seeds were again inserted. Present condition: a smooth white scar, soundly healed.

CASE 4. *Carcinoma; frenum of the tongue.*—Male, aged 56. Treated March, 1928. This patient had a large carcinomatous ulcer in the mid-line beneath the anterior part of the tongue, spreading on to the floor of the mouth and on to the alveolar ridge. Nine seeds were inserted for ten days. Present condition: soundly healed, no sign of disease.

CASE 5. *Epithelioma of mucous membrane lining the cheek.*—Male, aged 70. Treated April, 1928. Patient had a soft plaque with a velvet-like surface on the buccal mucous membrane of the right side of the mouth. The diseased area was 3·0 by 2·0 cm. in size with little surrounding infiltration. Six seeds were inserted for ten days. Present condition: no evidence of disease.

CASE 6. *Epithelioma of mucous membrane of cheek and gum.*—Male, aged 84. Treated January, 1928. On examination this patient was found to have a malignant ulcer with indurated edges and base, involving the right alveolar ridge and spreading on to the mucous membrane of the right cheek. Five seeds were implanted and removed 14 days later. Present condition: no sign of disease in the mouth.

CASE 7. *Sarcoma of tonsil.*—Female, aged 73. Treated February, 1928. This patient had a firm, smooth swelling in the left tonsillar region, which had been noticed for three months. Six seeds were implanted. Three were recovered 14 days later and three remain permanently in the tissues. Present condition: tumour has entirely disappeared. Mucous membrane is intact.

CASE 8. *Carcinoma of palate.*—Male, aged 60. Treated June, 1928. This patient was found to have an ulcer covered with slough, involving the whole of the soft palate, and extending forwards on to the hard palate. Ten seeds were inserted for 14 days. Present condition: after a very brisk reaction the ulcer is now almost healed.

CASE 9. *Carcinoma of pyriform fossa.*—Male, aged 52. Treated April, 1928. This patient, who had experienced some dysphagia for six months, was found to have a large fungating growth of the pyriform fossa, obscuring the cords. Five radon seeds were inserted for five days. He was examined again at the end of June. His symptoms had been relieved and the growth had shrunk to about one-third of its original size, the left cord, and part of the right, being visible. Five seeds were again inserted and left for 14 days. His first dose of radon was a small one owing to the possibility of acute œdema and obstruction.

CASE 10. *Carcinoma of bladder.*—Male, aged 54. Treated March, 1928. The patient complained of hæmaturia which started in January, 1928. On examination he was found to have a large infiltrating growth on the right side of the base of the bladder. Eleven seeds were inserted into the tumour. Present condition: satisfactory; patient has no further symptoms, and all bleeding has ceased.

CASE 11. *Epithelioma of anal canal.*—Male, aged 54. Treated December, 1927. This patient had a hard, craggy, ulcerated growth encircling the anal canal immediately within the anal sphincter. Pain and the passage of blood per rectum were prominent symptoms. Twelve seeds were inserted through the skin and left in the tissues at the periphery of the growth. On examination three months later no tumour could be detected. The pain and hæmorrhage had ceased.

Seeds have been successfully planted into growths of the œsophagus, but sufficient time has not yet elapsed to enable an opinion of the value of the method to be given.

General Conclusions.

1. The initial response of the tumour is more rapid than that seen with other forms of radium therapy. (2) The local reaction is brisk in some instances. (Another series of patients is now being treated with more heavily screened seeds.) (3) Owing to the very small size of the seed in proportion to the dose of radium it contains, there is a tendency on the part of the surgeon to implant the seeds too close together, and this over-radiation may possibly account for the severe reaction occasionally met with. (4) The use of seeds enables those tumours, which owing to their nature or position are difficult to treat by other methods, to receive thorough radiation.

We wish to express our gratitude to Mr. W. Lester Alton, physicist at the Radium Institute, and to his assistant, Mr. A. E. Southon, for their helpful advice and skill in the preparation of the apparatus.

THE BROMSULPHALEIN TEST OF LIVER FUNCTION.

BY ERNEST BULMER, M.D., M.R.C.P. EDIN., M.R.C.P. LOND.,

ASSISTANT PHYSICIAN, GENERAL HOSPITAL, BIRMINGHAM.

ABOUT 18 months ago my experiences of this test were published, and they were distinctly unfavourable, as a number of normal cases gave abnormal results, and even in cases of definite liver disease 20 per cent. of the readings were at variance with the clinical evidence.[1] For this series a bromsulphalein was made in this country, on the lines of statements made by Rosenthal and White in the *Journal of Pharmacology and Experimental Therapeutics* in 1924. It was subsequently found that this dye differed in certain particulars from that of Rosenthal and White, and in consequence did not give results representative of liver efficiency. Bromsulphalein is, at any rate at present, a proprietary obtainable only from Hynson, Westcott, and Dunning, of Baltimore. I am indebted to them and to Dr. White for having sent me the dye for use in this new investigation. The results are set out below, and they are a contradiction of the previous ones published.

A review of the history of the test was given at some length in a previous paper,[1] and only a few salient points need to be repeated. Bromsulphalein or phenoltetrabromphthalein sodium sulphonate was prepared by White; it is a whitish powder very freely soluble in water, and it can be given with impunity by intravenous injection in a concentrated solution. It is non-irritant, and in ordinary doses absolutely non-toxic. Normally the dye is seized by the liver, and the majority is excreted in the bile, traces only appearing in the urine. The rate of disappearance of the dye from the blood serum is important—after five minutes 20–50 per cent. remains in the blood, whilst at the end of half an hour there is none at all or a mere trace. It was argued that if the liver were damaged it would remove the dye with less rapidity from the blood after injection, and that the degree of retention of dye in the blood stream would give an indication of the degree of liver damage; the originators of the test, Rosenthal and White,[2 3 4] denied that it had any dependence upon biliary permeability.

Technique.

The patient is weighed and the dosage is calculated on a basis of 2 mg. of the dye per kilo body-weight—the body-weight of the patient in pounds divided by 55 will give the exact quantity in cubic centimetres of the 5 per cent. solution employed. It is injected slowly into one of the arm veins. Thirty minutes after the injection a sample of blood is withdrawn, preferably from the opposite arm, and in cases of early liver disease it may be necessary to take a sample after five minutes. After the blood has coagulated it is centrifugalised and the clear serum is pipetted into two small test-tubes. To one of these is added one or two drops of a 10 per cent. solution of sodium hydroxide to bring out the colour of the dye, and to the other tube a drop of 5 per cent. hydrochloric acid to clear the serum of any hæmolysis. The amount of dye in the serum is now estimated by direct comparison with a series of standards, using a simple comparator box in the usual way. The standards may be prepared by adding 4 mg. of the dye to 100 c.cm. of water that has been alkalinised with 0·25 c.cm. of a 10 per cent. solution of sodium hydroxide. This represents the 100 per cent. standard, and a series is prepared ranging from 5 per cent. upwards by dilution with alkaline water. In practice it is much simpler to employ the series of non-fading standards prepared by Hynson, Westcott, and Dunning. The 100 per cent. standard represents the amount of the dye that would be present in the blood stream if none were removed; it is thus an arbitrary standard calculated on blood volume.

Clinical Findings.

(*a*) Rosenthal and White[4]:—

	Cases.	Retention expressed in percentages after 30 minutes.
Non-liver	25 ..	0 or a mere trace.
Obstructive jaundice ..	5 ..	97, 96, 90, 35, 30.
Cancer of liver	2 ..	99, 20.
Catarrhal jaundice ..	3 ..	75, 50, 35.
Arsphenamine jaundice ..	2 ..	47, 22 (after 15 min.).
Biliary cirrhosis	1 ..	45.
Portal cirrhosis	3 ..	?, 22, 17.
Syphilitic cirrhosis ..	1 ..	3.
Pre-eclamptic toxæmia ..	1 ..	30.
Acute cholecystitis ..	1 ..	10.
Chronic ,, ..	1 ..	5.

(*b*) Friedenwald and Armstrong[5]:—

Catarrhal jaundice ..	2 ..	28, 36.
Cirrhosis of liver	5 ..	50, 40, 0, 5, 18.
Cancer of liver	9 ..	20, 45, 10, 36, 5, 8, 24, 18.
Syphilis of liver	1 ..	0.
Cancer of pancreas ..	2 ..	32, 24.

Non-liver Cases.—Cancer of stomach, 5; chronic cholecystitis, 11; achylia gastrica, 7; hyperchlorhydria, 10. All of these showed no retention.

(*c*) Rouillard [6] :—

Non-liver	25	..	No retention or a mere trace.
Cancer of liver	1	..	99.
Cancer of pancreas ..	1	..	97.
Suppurative cholecystitis	2	..	95, 90.
Catarrhal jaundice ..	3	..	75, 50, 30.
Arsenical jaundice ..	1	..	47.
Cirrhosis	3	..	45, 22, 17.
Calculous cholecystitis ..	2	..	10, 5.
Syphilitic cirrhosis ..	1	..	3.

(*d*) *Personal Cases.*—The technique used was that described above, and the results are expressed as the percentage retained after 30 minutes so that the figures are strictly comparable to those in the accompanying tables.

Non-liver Cases.

Gonorrhœa	9	..	5; three—0; five—trace.
Dyspepsia	2	..	5, 0.
Progressive muscular atrophy	1	..	0.
Hysteria	1	..	0.
Lymphadenoma	1	..	0.
Tb. abdomen	1	..	0.
Convalescent nephritis ..	1	..	5.
,, pneumonia ..	1	..	0.
Cancer of breast	1	..	Faint trace.
Slight cerebral thrombosis	1	..	Faint trace.
Normal	3	..	Trace, 0, 0.
Aortic incompetence ..	1	..	0.
Progressive bulbar paralysis	1	..	0.
Pleural effusion	1	..	5.
Pericarditis (convalescent)	1	..	0.
Asthma	1	..	0.

Liver Cases.

Portal cirrhosis	7	..	0, 25, 28 and 30, 7, 0, 25, faint trace.
Obstructive jaundice (cancer of pancreas).	4	..	105, 105, 40, 30.
Catarrhal jaundice ..	2	..	0 (convalescent, conjunctivæ just icteric), 53.
N.A.B. jaundice	5	..	0 (7 months after). 50 (22/6/27), 5 (29/6), 0 (6/7). 0 (15/7), 5 (21/7), conjunctivæ just yellow. 15, jaundice rapidly clearing. 70 (18/2/28), 105 (23/2).
Syphilitic jaundice (secondary stage).	1*	..	75 (2/3/28), 10 (28/3) after a course of N.A.B., much less yellow.
Cholecystitis	2	..	15, 10 (faintly subicteric).
Obstructive biliary cirrhosis following cholecystectomy—rigors, jaundice, enlarged liver and spleen.	1	..	11/8/27: 25. 3/9: 10—less jaundice. 7/9, drainage of common duct; almost died of cholæmia. 29/9: 10.
Cardiac liver — moderate jaundice.	1	..	18.
Non-calculous cholangitis with intermittent painless jaundice for 2 years.	1	..	30 (11/8/27), 30 (3/9).
? Pancreatic calculus ..	1	..	0.
Acholuric jaundice with cholelithiasis.	1	..	12.
Tested during N.A.B. treatment—no symptoms.	2	..	10 (last injection 14 days before); 0 (2 days before).
Congenital chorea ..	1	..	0.
Primary cancer of liver without jaundice.	1	..	5.

During the administration of choriotrope three cases were tested :—

1. 35 c.cm. given, the last dose being 18 days before the test and followed by jaundice—now clear. 40 per cent.
2. 15 c.cm. given, the last one month before the test. 0 per cent.
3. 33 c.cm. given, the last ten days before the test. 0 per cent.

Two of these cases require a little amplification; the fifth case of N.A.B. jaundice showed a very much greater retention after a period of treatment than before it (105 per cent.); she was clinically improved, however. A possible explanation is that the injection was given into the same vein from which blood was later withdrawn; it is probable that the sample was thus accidentally contaminated with dye from the skin or from the vein. One of the cases of cirrhosis was admitted to hospital for a painless hæmatemesis, a bromsulphalein test showed merely a faint trace of dye after half an hour; at operation later a definite early cirrhosis of the liver was found. There was no reason to suspect a sufficient degree of functional incompetence to produce any dye retention.

Conclusions.

1. Normal cases and those without any liver lesion showed a retention of 5 per cent. to a mere trace or even no dye at all.

2. Cases of liver disease showed a retention which probably represented fairly accurately the degree of liver damage or functional impairment; 100 per cent. retention means that no dye is removed from the blood, and a retention of, say, 50 per cent. would mean that the liver was 50 per cent. incompetent, and so on.

3. The test is one of liver function and not of biliary permeability; this is proved by the fact that many of the cases of complete obstructive jaundice did not give a 100 per cent. retention.

4. The test is safe, simple, and it appears to be the best one we have.

Finally, the writer would like to express his thanks to the honorary medical and surgical staff of the General Hospital, Birmingham, for their kindness in giving him access to their cases.

References.

1. Bulmer, E.: Quart. Jour. Med., 1927, lxxviii., 101.
2. Rosenthal, S. M.: Jour. Amer. Med. Assoc., 1924, lxxxiv., 1049.
3. Rosenthal and White, E. C.: Jour. Pharm. and Exper. Therap., Baltimore, 1924, xxiv., 265.
4. Same authors: Ibid., 1925, lxxxiv., 1112.
5. Friedenwald, J., and Armstrong, W. W.: Med. Jour. and Record, 1926, cxxiv., 679.
6. Rouillard, J.: Presse Méd., 1926, No. 34, i., 501.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1927 statistics of seven districts :—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Grimsby C.B. .. (88,340)	18·7	11·7	1·19	1·38	2·4	1·4	66/29	5·4	3·7
West Bromwich C.B. (81,140)	20·2	12·4	0·66	0·97	4·7	1·3	107/43	14·6	2·4
Carlisle C. and C.B. (56,620)	18·3	12·3	1·09	1·39	2·4	1·6	68/24	8·7	2·9
Eastbourne C.B. (56,710)	11·5	11·5	0·80	2·0	1·7	1·9	44/18	1·5	4·6
Tunbridge Wells B. (33,870)	12·8	15·7*	0·68	2·26	3·1	3·0	48/23	0·0	4·6
Leamington Spa B. (30,050)	13·5	14·1*	0·99	1·69	2·7	2·4	69/42	7·3	4·9
Colchester B. .. (45,170)	15·6	11·2	0·75	1·46	1·9	1·9	46/—	1·3	5·3

C.B. = County Borough. B. = Borough.

Health resorts, by attracting as residents old people and invalids, swell many of their death-rates. Thus the death-rates from all causes of Tunbridge Wells and Leamington Spa, when standardised for age and sex constitution of the population, become 11·5 and 10·74 respectively. The contrast between the infant and neonatal mortality-rates of the three health resorts shown above is very striking.

Grimsby.

Dr. B. C. Stevens reports that the municipal maternity home, with ten beds, erected on the council's housing site at Nunsthorpe, was opened for the admission of cases on Sept. 19th. Dr. Stevens thinks it will soon need enlarging. Seven notifications

and six deaths from encephalitis lethargica were recorded during the year. The notification of tuberculosis is still not nearly so complete as it might be. Of the 105 total deaths, 24 were of cases not previously notified, and only 29 lived for six months after notification. Insufficient institutional accommodation has been some excuse for incomplete notification in the past, but a scheme now under consideration for the extension of treatment facilities ought to meet this objection. Another feature of the work that requires development is the examination of contacts. At present the staff is insufficient for the visitation of homes for this purpose, and home visitation is considered by Dr. Stevens essential for the full development of examination of contacts. A combined clinic supplies artificial light treatment for the dispensary, the infant welfare centres, and the schools. "On the whole the results have been very encouraging and have amply repaid the expenditure." The total cases treated at the V.D. clinic during the last six years have been 1206, 827, 437, 465, 480, and 533, and the defaulters—that is, those who ceased to attend before being cured—for the same years numbered 547, 479, 184, 93, 89, and 79. Dr. Stevens advocates the establishment of a centre where persons, who have exposed themselves to the risk of contracting venereal disease, can be immediately disinfected by a skilled orderly. He thinks a capital expenditure of £100 or a weekly expenditure of £4 would be ample for the purpose, and that such a scheme would save money by lessening the need for treatment. The causes of the six maternal deaths were puerperal sepsis 2, antepartum hæmorrhage 1, post-partum hæmorrhage 1, and eclampsia 2. The midwives realise the importance of the antenatal supervision put upon them and are referring more cases to the antenatal clinic. The new cases at this clinic numbered 205, the total births being 1624.

West Bromwich.

Dr. W. Stott reports that in September it was decided to reorganise the health visiting staff and to replace the part-time nurses from the district Nursing Association by six newly appointed health visitors, who began their duties on Nov. 1st. The area of the borough is now divided into eight districts, and one nurse is responsible for all the health visiting services in each district. The medical staff has unfortunately been reduced from three to two. As a result it is impossible for the doctor to examine all the children brought to the centres, and it is also impossible to undertake antenatal and postnatal work. The outstanding feature of 1927 was the large number of deaths of children from pneumonia, caused by the prevalence of measles, whooping-cough, and influenza during the first quarter. Dr. Stott advocates provision for the home nursing of measles, whooping-cough, and pneumonia, with hospital accommodation for severe cases, and he further suggests that the first cases of measles or whooping-cough in children under 5 should be made notifiable. The instruction to the midwives to do antenatal work is receiving attention, but renders the provision of an antenatal clinic all the more urgent. Seventy-five stillbirths were notified in 1927 as against 58 in the previous year. There is, as yet, no definite orthopædic scheme, no scheme for the home nursing of children under 5, no minor ailment clinic in connexion with the welfare centres, and no dental treatment included in the maternity and child welfare scheme. Of the 46 deaths from pulmonary tuberculosis 10 were those of cases unnotified, and of the 8 non-pulmonary tuberculosis deaths 6 were those of unnotified cases. The sanitary inspector, Mr. H. H. Spears, after comparing the results of last year's housing inspections with those made of the same houses six and seven years previously, finds "that notwithstanding the general housing activities of the council, conditions as regards two-family occupation and overcrowding in such houses have in no wise improved." The new houses erected during the year numbered 466 and included 286 municipal houses. In a few outlying districts there are still some surface wells in use, and Dr. Stott refers to one used for the supply of three farms, which is liable to pollution by the overflow of the river. The opening of the new Health Department building in December will greatly facilitate the work.

Carlisle.

Dr. Joseph Beard says that the report calls for little comment and that the sanitary condition of the city generally may be said to be good. Out of 20 samples of fresh cow's milk two contained tubercle bacilli, resulting in the elimination of one milch cow from the city byres and of two outside cows from a herd in the Longtown area. The Ministry of Health have sanctioned 1728 municipal houses, 1540 "non-parlour" and 188 "parlour." Of these, 1394 have been completed and the remaining 334 were in course of erection at the end of the year. Dr. Beard complains that notification of tuberculosis is frequently so late as to be useless. During 1927 about 18 per cent. of the deaths were those of unnotified cases. A further 8 per cent. of the deaths occurred within one week of notification, while only 37 per cent. survived notification by more than three months. During 1926 the town clerk drew the attention of the medical men of the city to this failure to notify. The register of cases was completely revised during the year and now includes 145 males and 141 females of the pulmonary type and 46 and 47 respectively of the non-pulmonary type. This gives a total of 379, or about six times the average annual deaths during the last six years. Considerable difficulty is experienced in obtaining a satisfactory examination of contacts, but there is some improvement with regard to children. During the year the practising midwives attended 382 confinements and sent for medical help in 120, or more than 30 per cent. of their cases. The antenatal clinic was attended by 185 mothers who paid from three to four visits each; the total births numbered 1037.

Eastbourne.

Dr. W. G. Willoughby reports that 405 houses were erected during the year, of which 198 were municipal and 45 subsidised houses erected by private enterprise. No houses at low rents have been built recently except by the municipality, but houses at as low a price as £700 have been built for sale. The council assisted the private purchase of houses in 78 instances during 1927, making a total of 260 houses so dealt with. The temporary army hutments have been reduced from 188 tenements to 36 and the last 36 tenants are difficult to deal with, but "it is time that these huts should be totally demolished." The lowest rents for municipal "non-parlour" houses are 14*s.* 6*d.* weekly. The total of municipal houses occupied and planned is 723, but building for yearly needs must go on, says Dr. Willoughby, and particularly for those who canont afford the rent mentioned. Of the 764 applicants for new houses 90 have a whole house at present, 99 are newcomers, and 109 live outside the borough. Of the remaining 466, who have been in the borough more than five years, 78 have no child, 200 have one child only, and 89 have at least three rooms each. Dr. Willoughby estimates that there are at least 200 to 250 good tenants in a difficult position. There is too much sharing and subletting of houses, and many of the applicants would like a smaller house at a lower rent. Some of the municipal tenants have caused overcrowding by subletting. The municipal maternity home (ten beds) has been improved by the provision of extra accommodation for the staff and of facilities for antenatal work. The orthopædic clinic is run by a voluntary association for whom the local authority provides a consultant. An enclosure on the sea front, in connexion with it, allows sun treatment to be provided for children in the summer. Dr. Willoughby states that the regulations for the protection of meat have almost no practical effect owing to the restrictions involved. The majority of meat vendors object to sheltering the meat behind closed windows. Dr. Willoughby disagrees with those who favour the shortening of the stay of scarlet fever

patients in hospital. The revision of the tuberculosis register has reduced the cases to 318 which is about seven times the tuberculosis deaths for 1927. The rainfall for the year was 38·22 in. The sunshine record, 1698·8 hours, was the fourth highest recorded in the United Kingdom, excluding the Channel Isles and Scilly Isles.

Tunbridge Wells.

Dr. F. C. Linton says that apart from a sharp outbreak of influenza in February involving temporary school closure and causing many deaths amongst old persons, there was no notable outbreak of infectious disease during the year. The municipality works chiefly by subsidising voluntary institutions. Since April 1st, 1928, an agreement has been made for the treatment of children by massage, exercises, electricity, &c., at the clinic established at the general hospital. The district Nursing Association is subsidised for the home nursing of children and for the provision of a nurse-midwife in Rusthall. Payment is made by fees to various hospitals for the treatment of tonsils and adenoids. An arrangement has been made with the maternity home for the admission of municipal cases and three cases were sent in in 1927 where the mother's home environment was unsatisfactory and her circumstances needed financial aid. A chart shows that diphtheria was exceptionally prevalent from 1896 to 1900 and again from 1911 to 1915. Dr. Linton argues from these figures that the disease should be rife from 1926 to 1930 and in accordance with his prediction the notifications rose to 42 in 1927, after an average of about 12 for the four preceding years. There was only one death. The school report shows that the question of an open-air school for 40 children has been advanced a stage further by the raising of £1000 by voluntary contributions. Dr. J. A. Walker Wood began work as aural surgeon in the schools in April, 1927. The rainfall was 40 in. and the hours of bright sunshine 1527¾.

Leamington.

Dr. W. L. Goldie reports that the baths have been rebuilt and now compare most favourably with those of any spa in the country. A new scheme of filtration has been installed for both the men's and women's swimming baths. The total number of council houses was brought up to 286 by the erection of 83 during the year. There were 12 subsidised private enterprise houses. The "Leamington Slum Clearance" Company built eight houses at Lillington which were intended to be let at an inclusive rental of 5*s.* a week, but were ultimately let at 10*s.* An agreement has been made with the Warneford Hospital for the subsidisation of three maternity beds. Mr. G. C. Alderson, who is in charge of the obstetric department of this hospital, conducts an antenatal clinic for the patients seeking admission to the hospital, and he has been appointed specialist for the purpose of the Puerperal Fever Regulations. The rainfall was 28·84 in. and the record of bright sunshine 1121·7 hours.

Colchester.

Dr. W. F. Corfield gives a table, which shows that 24 of the 35 infant deaths were due to congenital debility and premature birth. He hopes that the work of the antenatal centre begun in March, 1928, will help to reduce this figure. The deaths of children during the first year of life numbered 35, during the second year 14, and of those from 2 to 5 years 13. An effort is being made to find suitable premises for a maternity home, but so far unsuccessfully. The orthopædic clinic is doing good work and treated 17 infants as compared with 9 in the previous year. A difficulty has arisen with the local division of the British Medical Association with regard to the appointment of a consultant for the purpose of the Puerperal Fever Regulations. During the year 192 subsidised houses were built, 106 municipal and 74 by private enterprise. Reports of overcrowding are still received and there is need of accommodation for the poorest working-class families. Unfortunately a large number of families have to live in two rooms or even one room owing to the cost of housing accommodation. During the past years there has been much building of new houses in the outskirts. This is being now followed by the extension of water mains and sewers, which should ultimately enable shallow wells to be closed and cesspools to be abolished. During 1927, however, 19 new cesspools and 7 new wells were constructed. About 550 "hand-flushed" closets have been provided with a water-supply during the last three years.

SCHOOL MEDICAL SERVICE.

Name of district.	No. on roll.	Aver. elem. school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.*
Northampton C.B.	12,352	11,107	3,432	7,687	18·7
Bournemouth	7,984	6,796	2,160	3,952	14·0
Hull	47,517	38,614	17,075	34,719	15·8

* Excluding uncleanliness and dental defects.
C.B. = County Borough.

Northampton.

IT would, we think, be admitted that the extent of the facilities for preventing and treating childish defect and disease is a fair measure of the interest taken in child hygiene by any community. Judged by this standard Northampton comes out badly, for in this county borough even the routine inspections cannot be overtaken by the school medical staff, and much of the value of their work is necessarily lost. Dr. Stephen Rowland, in his introduction to the report by Dr. J. H. Mason, says he does not think that the two sessions per week now given by the assistant tuberculosis officer will be sufficient to keep pace with the work; he does hope, however, that the arrears in dental treatment will be made up by the second dentist now appointed. Dr. Mason, who until last October carried out the school medical work single-handed, draws attention to the large number (246) of delicate, anæmic, and debilitated children who would benefit by the régime of an open-air school. Dr. Rowland is "not convinced that the so-called 'open-air school' is much in advance of the latest elementary schools opened in Northampton." He does not describe the conditions of these new schools, but it would seem that a properly constituted open-air school, with a specially designed curriculum, where there is fuller medical supervision, extra rest, suitable meals, and out-of-doors lessons and games, is more suited to the needs of a delicate child than even the most modern elementary school where the curriculum and routine work are arranged for the average healthy normal child. It is often the endeavour to keep pace with his more lusty fellows that pushes the delicate child over the brink of definite ill-health. Dr. Mason describes the work done in Wellington-place Special Mental Defective School, opened in 1907, and supervised from its inception by Miss Longland, who also acts as secretary to the committee of voluntary workers which looks after the welfare of past pupils. In all, 234 children have passed out, of whom 24 are dead, 101 are either in institutions or not in work, and 109 are partially or wholly self-supporting. Whatever the future may hold in the way of prevention or of treatment of mental defectives, it is certain that the discipline, interest, and self-respect instilled by the simple manual occupations at present taught in the special schools is well worth the cost, for if these unfortunates are left unheeded they become a greater burden on the community.

Bournemouth.

Dr. T. S. Stirling remarks that the general work of medical inspection is progressing satisfactorily, and notes a continued improvement in the standard of

personal hygiene due to the work of the school nurses, aided by lending out, if required, of special combs with a leaflet of instruction. The dental work has been efficiently carried out, but there is still a long list awaiting treatment, and the pre-school child must not be forgotten. Dr. Stirling says that in this, as in many of the other defects and diseases of childhood, preventive treatment should be attempted at an earlier age; this, with a suitable physiological diet in infancy, will lessen the prevalence of dental caries in school children. The idea of the special class for backward children was to return these children after a course of 6 to 12 months to their own school with a reasonable expectation of making normal progress; this has not been realised, though the children have derived benefit, especially physically. Probably there are in this class all three types of retarded children—namely: (1) The true backward, that is those who have merely lost education time through being handicapped by disease or physical defect, and thus need a recovery class; (2) the true dull, those who are mentally slow and better with concrete material, and thus need a handicraft class; (3) the true mental defective, mentally lacking in all kinds of intelligence, needing training in concentration, stabilising in temperament, and some degree of care, control, or supervision in after-life. The formation of even this one experimental class is of value, especially as it is a small one with only 15 children, so that an energetic teacher will try to group the children for herself. It is, however, regrettable that there are no special schools and particularly no open-air school, for there are in Bournemouth 246 delicate children with whom results could be obtained comparable with the splendid record of many similar towns.

Hull.

Dr. W. Allen Daley deals with important schemes of reorganisation, details of which are given by his chief assistant, Dr. J. Morrison. Routine examinations have increased from 15,526 in 1926 to 17,075. The standard of marking for defects has been made slightly more stringent, to bring it into line with that of other authorities; thus the percentage of defects this year amounts to 15·8 compared with 10·5 in 1926, although the actual numbers of defects have probably not increased. Special inspections show a great increase as the result of the new scheme by which teachers send children to the medical officer at a school clinic, instead of waiting for a routine visit to the school. Treatment at the clinics has been greatly expanded—6200 minor ailments were treated this year as against 3281 in 1926. X ray treatment for ringworm will in future be given by the two newly appointed radiologists. In dental treatment there has also been a reorganisation of the scheme, including an extension to include the 5-year-old group, increased general facilities with the appointment of an additional dentist, and the elimination of casual cases, which are very unsatisfactory. There are, further, some new activities at the clinic; those of the aural surgeons, Mr. T. Ritchie Rodger and Mr. R. R. Simpson, whose expert opinion is found so valuable in cases of tonsils and adenoids, and of the orthopædic clinic just started under Mr. R. B. Blair. This orthopædic clinic deals also with cases referred by other departments—the general public health, the tuberculosis, and the maternity and child welfare.

The planning of this work as regards school-children was temporarily upset by an epidemic of acute poliomyelitis affecting 22 children over 5 years of age, and over 70 below that age. Of the older group one died during the attack, in four cases the paralysis cleared up, and in 17 there remained varying degrees of disability, though, as usual, there was some tendency towards recovery. The younger group is not similarly described, but it is certain, as Dr. Morrison says, that the epidemic will leave lasting traces among the school-children of future years. The action taken illustrates very well the advantages of coördination. Many of the victims were isolated and treated in the City Hospital; they were examined by the school orthopædic surgeon, who prescribed the treatment to be carried out both in hospital and after discharge. Later they were taken to the Park Avenue School for physically defective children, where splints were applied when necessary, and appointments made for massage, electricity, or remedial exercises at the orthopædic clinic. In the case of private patients, letters were sent to the doctors offering facilities for treatment at the orthopædic clinic, which was in the majority of cases accepted. Two recently appointed orthopædic nurses carry out this treatment at the clinic under the supervision of the surgeon. Minor postural deformities are reported to the organiser of physical training for special exercises to be given at school.

Another important step has been taken in the new practice of examining mentally all the children admitted to the craft classes, thus raising these classes to their proper function of dealing with the concrete minded children, who are intelligent enough but not literary, instead of allowing these classes to become the dumping ground for all types of retarded and defective children. The whole report shows evidence of a highly efficient staff working with an enlightened local authority.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 4TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 126 (last week, 149); scarlet fever, 1461; diphtheria, 882; enteric fever, 277; pneumonia, 526; puerperal fever, 39; puerperal pyrexia, 85; cerebro-spinal fever, 7; acute poliomyelitis, 2; acute polio-encephalitis, 2; encephalitis lethargica, 28; dysentery, 7; ophthalmia neonatorum, 139. No case of cholera, plague, or typhus fever was notified during the week.

A large proportion of the cases of enteric fever were notified in London and the home counties, viz.: London 87 (of which 26 in Kensington, 17 in Wandsworth); Buckingham, 4; Essex, 5; Hertford, 7; Kent, 7; Middlesex, 25 (of which Ruislip-Northwood 6); Surrey, 97 (of which Beddington and Wallington 24, Epsom 23, Sutton and Cheam 10, Epsom Rural 18). The 277 notifications included 175 cases of paratyphoid fever, of which 60 were notified in London, 83 in Surrey, and 11 in Middlesex.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on August 7th–8th was as follows:—Small-pox, 17 under treatment, 1 under observation; scarlet fever, 1706; diphtheria, 1681; enteric fever, 72; measles, 263; whooping-cough, 187; puerperal fever, 14 (plus 9 babies); encephalitis lethargica, 71; poliomyelitis, 2; "other diseases," 15. At St. Margaret's Hospital there were 17 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (2) from enteric fever, 21 (2) from measles, 2 (2) from scarlet fever, 36 (4) from whooping-cough, 29 (5) from diphtheria, 50 (14) from diarrhœa and enteritis under two years, and 16 (4) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London was reported from Edmonton. Of the 19 fatal cases of measles outside London, 6 were reported from Liverpool and 3 from Newcastle-on-Tyne. Belfast reported 5 in the same week. Of the 32 fatal cases of whooping-cough outside London, 7 were reported from Birmingham, 4 from Manchester, and 3 from Liverpool. The deaths from diarrhœa showed no increase.

The number of stillbirths registered during the week was 295 in the great towns (corresponding to a rate of 41 per thousand births), including 43 in London.

THE PROCEEDS OF HOSPITAL FÊTES.—During the last eight years, Hendon Cottage Hospital has received £7287 as the proceeds of an annual fête. This year's event resulted in a profit of £1050.

Reviews and Notices of Books.

TRAUMA AND COMPENSATION IN OBSTETRIC AND GYNÆCOLOGICAL CASES.

By DOUGLAS MARSHALL LINDSAY, M.D., F.R.F.P. & S. Glasg., Senior Assistant Visiting Surgeon, Royal Samaritan Hospital, Glasgow. London and Edinburgh: William Hodge and Co., Ltd. 1928. Pp. 172. 7*s.* 6*d.*

THIS book is a useful contribution to a subject either cursorily dismissed or not considered at all in obstetric and gynæcological treatises. Yet, as the author points out, application for damages is very common among women, and real or fancied injury to a pregnancy offers "a good background for the staging of a case before an impressionable jury." The number of cases quoted from Dr. Lindsay's own experience serves to show both the frequency of claims of this kind and the solid foundation of practical knowledge on which this book is built. The instructions as to methods of examination, the way to record findings, and the precautions to be taken when giving an opinion are excellent.

Concerned, as it is, with a very special side of obstetric and gynæcological practice, this book may not appear to be of general interest, but even a superficial glance reveals many points that have a much wider application than its title suggests. It contains, for example, an excellent review of the diagnosis of pregnancy in which the various symptoms and signs are weighed and the value appraised of those that are of use in estimating the stage that the pregnancy has reached, and in determining the life or death of the fœtus in utero. One sign in the diagnosis of pregnancy, that form of external ballottement known as "dipping" has been overlooked. To many it is the most certain and quickest method of differentiating the pregnant uterus from other cystic swellings at or about the umbilical level and before fœtal parts can be distinctly recognised.

Dr. Lindsay makes a very definite statement that trauma is never a causative factor in the production of a neoplasm; his views on this question are diametrically opposed to those expressed by Dr. Janet Lane-Claypon in regard to injury as an ætiological factor in mammary carcinoma (Ministry of Health Report No. 32). Sarcoma of bone appearing after injury he regards as "having probably been the precursor of the fracture." Whilst refusing to consider a traumatic cause for pelvic growths, simple or malignant, he gives full consideration to the possibility of their being adversely affected by injury, as by the occurrence of torsion, rupture, necrosis, and infection.

The volume has closed a distinct gap in gynæcological literature, and will be found exceedingly helpful to those who have to make frequent appearances in the law courts to give a medical opinion in those compensation cases or actions for damages in which possible pelvic injury to women is in question. The author's experience in obstetrics and gynæcology, and as assistant to the Professor of Medical Jurisprudence in Glasgow, makes his advice of particular value in such cases.

EXPERIMENTAL EMBRYOLOGY.

By THOMAS HUNT MORGAN, Professor of Experimental Embryology in Columbia University. New York: Columbia University Press. 1927. Pp. 766. 37*s.* 6*d.*

THE introduction of experimental methods, chemical, physical, and physiological, into embryology is an important development. Although such methods have been applied for over 40 years by a few scattered workers and have yielded fruitful results, these results have so infrequently been brought to the general notice that those not intimately familiar with the work have difficulty in correlating them and in appreciating their full significance. Prof. Morgan's book, which is a complete and critical survey of the important experimental researches, will be welcomed. Moreover, it will appeal to a wider section of scientific workers than did the older embryology books, which described the building up of evidence in a chain of pictures revealed by the microscope. The experimentalists have called into play methods more proper to the chemical and to the physiological laboratories. This change of outlook has revealed new lines of attack on the problems presented by each stage in the complicated process of development. The changes which take place in the process of fertilisation of the egg are vast and complex. Already the amount of fruitful experimental research relating to that incident alone, including the questions of the activity, chemotaxis and agglutination of spermatozoa, the fertilisation membrane and its functions, selective fertilisation, cross-fertilisation, and polyspermy, exhausts eight chapters, or over 100 pages of the book.

The remaining six hundred odd pages are occupied with the questions involved in the changes in cytoplasm prior to cleavage of the cell, and in the movements of groups of cells following cleavage. Such matters as growth, reflex actions, and trophistic movements of larvæ, sex determination, embryonic grafting, the influence of environment on the development of the embryo, and the source of energy of development, are promised for a future volume. The investigations relating to each section are recorded more or less in their chronological order. The author's conclusions, which are restrained and conservative, are inserted into the text at intervals none too frequent. His obvious reluctance to introduce speculative matter might indeed have been modified to the extent of furnishing short summaries at the end of each section, for an historical account of such complex work must necessarily in places be disjointed, calling for effort on the part of any reader anxious to understand the trend and significance of the progress made. However, since Prof. Morgan provides over 2000 references to works on experimental embryology and sets forth concisely and lucidly a description of practically every important piece of work that has been done on the subject, no one need complain.

To workers in every branch of biology who are seeking for a new line of research this book should provide a mine of inspiring suggestions.

ENDOCRINE DISEASES.

Endokrine Krankheiten. By Prof. Dr. HANS CURSCHMANN, Direktor der medizinischen Universitätsklinik zu Rostock I.M. Dresden and Leipzig: Theodor Steinkopf. 1927. Pp. 151. R.M.8.5.

THE series of monographs to which this volume belongs is designed to give a practical survey of the various domains of medicine. Prof. Curschmann's Endocrine Diseases can claim to have fulfilled this object. Controversial matter has been almost entirely ignored, and where theoretical interpretation is still far from clear the author has contented himself with giving the facts and a short allusion to the difficulties. No condition associated with disease of the endocrine system seems to have been omitted. The method of dealing with any particular gland is to give first a short description of its anatomy and physiology, then a detailed account of the symptomatology, pathogenesis, prognosis, and treatment of diseases associated with it. Certain rare metabolic disturbances of uncertain origin are included. For instance, a section is devoted to what is termed endogenous cachexia. This condition is conceived as the clinical antithesis to endogenous obesity. The author differentiates it from a masked hyperthyroid-

ism, in which there are no eye or circulatory disturbances, and from wasting of hypophyseal origin (Simmond's disease). The metabolic rate is not raised nor is the protein metabolism increased, as in Graves's disease, and yet there occurs a progressive loss in weight until the patient becomes a veritable skeleton. The author claims that by psychotherapeutic measures the appetite of these cases can be so stimulated that the weight increases. By doses of insulin up to 20 units daily weight can also be made to increase, but the writer denies that the condition is in any sense of the word a "hypo-insulinism." In view of the most recent work on mongolism it is strange to find this condition included in this monograph; indeed, the author himself, having described the malformation, concludes that there is no evidence of an endocrine dyscrasia. An interesting point in the treatment of exophthalmic goitre is emphasised—the importance of diet. This is a revival of the old view of Blum that the diet should consist of foods containing a minimum of tryptophane, which is the chemical basis of thyroxin. Meats, milk, cheese, eggs, and wheat are rich, whilst maize, rye, potatoes, and fruits are poor in this substance. However, since one of the main objects of treatment is to re-establish nitrogen equilibrium in the exophthalmic patient, it would not be very easy to avoid those foods which are here condemned.

The section on diseases of the sex glands has been written by Dr. F. Prange and is well illustrated. The space allotted to details of treatment in this book is rather scanty, but the general principles which should guide the management of the patient are made clear.

THE CLINICAL EXAMINATION OF THE LUNGS.

Second edition. By E. M. BROCKBANK, M.D. Vict., F.R.C.P.; and ALBERT RAMSBOTTOM, M.D. Vict., F.R.C.P. London: H. K. Lewis and Co., Ltd. 1928. Pp. 112. 5*s*.

THIS book was written for students, and is intended to outline the methods of examining the chest. It is not sufficiently detailed to appeal to the post-graduate student, who would require more detail. After a brief chapter on physiology and anatomy, five chapters are given up to a discussion of the symptoms and physical signs of pulmonary disease, the authors following the orthodox order of inspection, palpation, percussion, and auscultation. The last chapter deals with physical signs of common pulmonary diseases, and this is too sketchy to be of real value even to students. Very little space is devoted to each disease, such a variegated condition as new growth of mediastinum, lung, and pleura being dismissed in six lines. The reader is told that X ray examination is a useful aid to diagnosis in various conditions, but it is not made clear in what way it may help. At the end of the book are eight X ray plates illustrating a normal chest and various pathological conditions. If the volume is regarded as a convenient and clear, but not exhaustive, account of physical signs and symptoms in diseases of the chest it will prove a useful addition to the students' library.

BACTERIOLOGY.

Handbuch der Pathogenen Mikroorganismen. Third edition. Edited by KOLLE and WASSERMANN. Revised and enlarged with the assistance of W. KOLLE, R. KRAUS, and P. UHLENHUTH. Jena: Gustav Fischer; Berlin and Vienna: Urban and Schwarzenberg. 1928.

THE new edition of Kolle and Wassermann's well-known text-book upon bacteriology is now in process of making its appearance in instalments; up to the present time 12 parts have been received, representing portions of the ten volumes of which the book will ultimately consist, none of which has yet appeared in its entirety. The wealth of detail is greater than that given in any other work on bacteriology with which we are acquainted; the article on plague, to take a single example, by Dieudonné and Otto, occupies 223 pages and is superbly illustrated. The work is already firmly established as a mine of information upon all the ramifications of bacteriology and immunity. Amongst the subjects dealt with in the parts which we have received are plague; Asiatic cholera, which comprise the whole of one part, a matter of 178 pages; glanders; rinderpest and other special animal infections; diplococcal infections; and a large part of the subjects of general bacteriology, immunity and serology. When complete the book will form a standard book of reference and, meanwhile, has the advantages of a series of monographs, each contributed by an authority in his own special sphere.

INVESTIGATION OF THE CONCENTRATION OF LACTIC ACID IN BLOOD AND URINE UNDER PHYSIOLOGIC AND PATHOLOGIC CONDITIONS.

By OTTO JERVELL. Acta Medica Scandinavica, Supplementum XXIV. Oslo: Nationaltrykkeriet. 1928. Pp. 135.

THIS book consists of a collection of researches carried out during the last four years by the author, partly at the Physiological Institute of the University of Oslo, and partly at the Oslo Municipal Hospital. It is divided into three parts: the first, an introduction, deals with previous work and methods of analysis, the second with lactic acid under physiological conditions, and the third with the concentration of lactic acid in the blood in various pathological states. In the first part some six pages are devoted to a very brief review of the work, beginning with that of Fletcher and Hopkins in 1907, which deals with the rôle of lactic acid in the metabolism of carbohydrates. Dr. Jervell then proceeds to describe the method used by him for the estimation of lactic acid in blood and urine. In the case of blood, the proteins are first precipitated by tungstic acid, as in Clausen's method, using 2 c.cm. of blood. The glucose, together with a part of the uric acid, is then removed from the filtrate by the use of copper sulphate and calcium hydroxide. The estimation is performed upon the filtrate from this precipitation by Hansen's method, which involves the oxidation of the lactic acid to acetic acid and carbon dioxide by a measured excess of potassium dichromate solution and sulphuric acid. The unused dichromate is afterwards estimated iodimetrically. When lactic acid in urine is being determined, it is necessary first to extract the lactic acid by means of ether, using Clausen's apparatus for this purpose. Tables are given showing that the mean error is approximately 5 per cent. In the second section, the lactic acid concentration of human blood during rest is first investigated. The average value of a series of determinations on four subjects is found to be 27 mg. of lactic acid per 100 c.cm. of blood, the extreme values found being 21 and 31·5 mg. per cent. The difference between the lactic acid figures of fasting subjects and those who have had a breakfast of bread and milk is shown to be negligible. Then follows an investigation of the lactic acid concentration in blood during muscular work, using a cycle-ergometer. In every case muscular exercise produces hyperlactacidæmia, the increase being greater in the first minutes of exercise than later. Large outputs of work (over 1000 kg. meters per minute) bring about a considerable increase of lactic acid concentration in the blood; on resting, this slowly falls off, reaching the normal value again in about half an hour. Mild exercise causes this falling off to be slightly more rapid. The hyperlactacidæma is due to a shortage of oxygen, and the oxygen debt calculated from the lactic acid present is approximately equal to that actually found. The urinary lactic acid after physical exercise may increase to 1 per cent., the excretion in the urine being increased by the administration of alkali.

The author then proceeds to investigate the lactic acid concentration of blood and urine in subjects

where impeded oxygen intake might be supposed to lead to hyperlactacidæmia. Examinations of 29 patients with heart disease, five of which were compensated, are quoted. In compensated heart disease the lactic acid concentration of the blood is normal, but it is frequently increased in cardiac insufficiency. In anæmia the lactic acid in the blood is found to be increased in a large proportion of the cases examined. Pneumonia and pulmonary tuberculosis may lead to increased lactic acid concentration in the blood. Fever does not increase the lactic acid content, but in spastic conditions hyperlactacidæmia is observed. In nephritis this is the case only where uræmia is present.

The book would be more readable if the sections had been planned to form a connected story instead of in a form resembling a series of publications in a scientific journal, but it represents a large amount of interesting work. A well-selected bibliography is included at the end of the volume.

DENTAL PROSTHETIC MECHANICS.

By D. M. SHAW, Curator of the Prosthetic Laboratories, Royal Dental Hospital of London. London: Edward Arnold. 1927. Pp. 373. 21*s*.

THIS book has been written for the dental student and for the laboratory mechanic, and the author expresses a diffident hope that it will interest the dentist as well. He rates his book too modestly. This is a most stimulating and original treatise on practical dental prosthesis. Mr. Shaw has had a wide experience as a teacher, and has also been active in research which has attracted attention from dentists and anatomists. He has not attempted to give a formal account of the steps in the construction of a denture, but rather to consider the various aspects of dental prosthesis and to comment on the underlying chemical, physical, and anatomical principles involved. This leads him into a consideration of many difficult problems which demand the close attention of the reader, but he does not neglect to mention practical tips which the laboratory worker will find useful. His views are not always orthodox, and the dentists who have given special study to dental prosthesis may find themselves in conflict with some of them; but they will not find it easy to dispose of his arguments. Among the sections to be singled out for special praise are those on the setting up of artificial teeth, articulators and metal-plate work. The preliminary chapter on the arrangements of the natural teeth is a useful contribution to an aspect of dental anatomy which has not received much attention.

The style in which the book is written is rather involved, and it is sometimes difficult to follow Mr. Shaw's meaning, but the effort is worth making, for the book shows real originality. It is well illustrated and excellently produced.

JOURNALS.

MEDICAL WOMEN'S INTERNATIONAL JOURNAL.—The May issue (Vol. I., No. 6) is given up entirely to the proceedings of the open meeting of the Medical Women's International Association held at Bologna from April 11th to 14th last. Summaries are given of all the 34 papers on the two subjects selected for discussion—viz.: (1) medical measures for the protection of children in various countries; and (2) diseases of the eye in relation to general medicine. The abstracts are printed in English or French, the journal being reluctantly restricted to these two languages on financial grounds. It is understood, however, that the Italian association of medical women is bringing out its own report of the proceedings, and the German association publishes its own monthly journal. The papers, even in summary, are well worth careful study, and it is a pleasant surprise to find an example of an international journal which does not contain typographical errors.

New Inventions.

IMPROVED FORCEPS.

SOME years ago when working out an instrument for holding that very friable organ, the tonsil, during dissection, I designed a grip which I believe to be both new and of a fairly wide application in surgery. Its principle is to produce a ruck in the material grasped by its blunt overlapping jaws (A), much in the way of the Army Regulation fastener for webbing

straps. It is obvious that a grip of this sort will tear out less easily in flimsy material than one that depends for its hold on piercing or crushing. The original tonsil forceps (B) proved so popular that I have had two other models made—a tissue forceps (C) which is very useful for holding tuberculous glands, cyst walls, and other "washy" tissues, and a bowel forceps (D) which I think will grip intestine more firmly and with less damage than anything else I have ever tried.

The forceps are made by Messrs. Allen and Hanburys, 48, Wigmore-street, W.

DENIS BROWNE, F.R.C.S. Eng.

Reports and Analytical Records.

EUROSPA.

(S. R. TOOGOOD, 173, KING'S-ROAD, HARROGATE.)

EUROSPA is a cream-coloured powder which claims to possess the curative properties of the salts contained in the natural medicinal waters of Harrogate, Bath, Wiesbaden, and Vichy. On analysis, the following results were obtained:—

Moisture	6·10 per cent.
Matter, insoluble in water ..	9·16 ,,
Matter, soluble in water ..	84·74 ,,

The insoluble matter consisted of magnesium phosphate and a little sulphur. The soluble matter comprised sodium sulphate (37 per cent.), magnesium sulphate (16 per cent.), small amounts of potassium salts, tartrates, and citrates, and traces of lithium and chlorides. The sulphur (2·5 per cent.) probably is present as "potassa sulphurata." When dissolved in water the solution was slightly alkaline and had a distinct odour of sulphuretted hydrogen.

THE LANCET.

LONDON: SATURDAY, AUGUST 18, 1928.

THE DETENTION OF MENTAL PATIENTS.

If mental disease may be no more than transient, it is obviously wrong to begin its treatment by taking steps which will permanently damage a patient's chances in the struggle for existence. Everyone agrees, therefore, that certification should be a last resort rather than the normal preliminary of mental care, and the Royal Commission on Lunacy proposed a form of machinery designed to give this principle effect. They recommended that cases requiring institutional treatment should be differently managed, according to whether the patients were "voluntary" or "involuntary," and the medical profession has cordially accepted their suggestion that "voluntary boarders" should be admitted into mental hospitals, licensed houses, nursing homes and single care on the strength of their written application. Discussion continues on the question whether such an application justifies detention of a patient who objects to the treatment, but for the moment our object is to draw attention rather to the conditions under which he can in the first place be regarded as "voluntary." The proportion of mental patients who are ready to accept treatment is none too large, and by the Commission's plan only these would be protected from legal intervention. It is true that the intended reforms would permit of a modified form of certification in cases where recovery is expected within six months, for if the prognosis is good a patient would be treated under a Provisional Treatment Order without actual certification. But for such an Order to be given the signature of a magistrate would be required, and it is far from unreasonable to argue that it is this intervention by a legal officer, with its attendant publicity, that confers the social stigma of insanity. Bearing this in mind, the Representative Body of the British Medical Association, as we recorded on p. 240 of our issue of August 4th, reached the conclusion that the Commissioners' reforms do not go far enough, and gave its approval to an alternative plan, by which the law's intervention would be reserved for cases in which the patient, though capable of volition, definitely refused or resisted institutional treatment. Under a scheme of this kind the "voluntary" boarders would include all those who made no categorical objection to being so declared, and this would undoubtedly increase the number of people who would receive institutional care without having been certified. Furthermore, the knowledge that treatment could be got on these terms would encourage the friends and relatives of a patient to have him properly looked after at an early stage.

From the medical standpoint, therefore, the Association's proposal has much to recommend it; but there are certain obstacles to its being adopted. In the first place it may be observed that though reform of our lunacy law is inevitable, the prospect of it is by no means immediate. Sir Frederick Willis, lately chairman of the Board of Control, not long ago described the efforts of the Board to obtain amendment of the Lunacy Acts, and attributed their failure to a public apathy which refuses to be disturbed. The only noticeable symptom of any change in this attitude has been alarm at the restriction of liberty which the law already allows. This manifestation has taken the form of awarding fanciful damages against medical practitioners on the alleged ground of negligence in certification, and its result has been to make administration of the law more difficult, so that we approach a deadlock. What, then, will be the attitude of the public towards the British Medical Association's suggestion that a patient should be admitted to an institution without his consent, merely "on an 'Authorisation for Treatment' given by a relative or friend and supported by a 'recommendation' signed by two medical practitioners"? Will they not regard this as evidence of a desire on the part of medical men to be given powers altogether outside their proper province? Will they not think of it as another and flagrant attempt to strengthen the grip of the profession on mankind? The liberty of the subject is a national ideal, and one which no law reformer is likely or anxious to ignore. Though the law, in varying degrees at various stages of its history, has regarded the lunatic, the married woman and the infant as not fully capable of legal rights, Parliament would hardly dare to-day to decree that any of these classes of persons should be compulsorily detained in the absence of judicial proceedings.

One aspect of this proposal deserves more thought, perhaps, than it has yet received. If mental patients are to be placed in institutions without their express consent, on the decision of a relative or friend, recommended by two doctors, an unavoidable responsibility is bound to fall on the medical men concerned. Civil actions would certainly be brought against them from time to time, and it would not be at all surprising if lay juries were to make the most of these opportunities of registering a natural dislike of iatrarchy, or government by doctors. The profession is at the moment averse from increasing the number of vulnerable areas in its own skin, and is, indeed, anxious to disclaim a good deal of the responsibility placed upon it under the present Lunacy Acts. It is increasingly felt, moreover, that the further protection, which (to quote the Royal Commission) "should be given to medical men in the discharge of their professional duties in relation to insanity," can best be obtained by putting more of the onus of certification upon the representatives of the law rather than by taking it away from these officials. While no practitioner would wish to escape his proper liability to take due care, the British Medical Association's Representative Body has itself approved the principle that "the judicial authority, when it intervenes, shall accept responsibility for the detention of persons of unsound mind." And, oddly enough, this attempt to minimise medical responsibility is more likely to win public approval than the Association's plan for minimising legal intervention; though the former is made purely in the interest of the profession, whilst the latter is designed entirely for the benefit of mental patients.

RECENT FOOD INFECTIONS.

LONDON and the home counties have been unpleasantly aware, during the last week or two, of the prevalence of an infectious fever of the enteric group, some 90 cases being under treatment in the M.A.B. hospitals on August 14th. The disease has shown no respect for age or class, and has not been localised to any one area, although certain districts such as Kensington and Epsom have furnished most of the cases. On the whole the symptoms have been mild, the chief being headache and fever. In the average case there has been no vomiting and no diarrhœa, but rather constipation; the majority have shown rose spots in abundance, and a slightly enlarged spleen. Though a few cases have been severe and one death has been reported from Epsom, the outbreak cannot be regarded as really alarming. The organism responsible is *paratyphosus-B*, distributed it is presumed by food; while no particular comestible can as yet be definitely incriminated, cream is under grave suspicion. Since the beginning of the year it has not been permissible to add preservatives to cream and the suggestion has been made in many newspapers that there is some connexion between this prohibition and the present outbreak of infectious fever. A priori this is unlikely, for it has been shown that the maximum addition of boric acid heretofore customary—namely, 0·4 per cent.—has no effect on the growth or vitality of the paratyphoid bacillus, and that five times the quantity is needed to exert any restraint on the organism. It should be borne in mind, also, that in the ordinary course of events paratyphoid organisms in cream originate from the organisms in the raw milk from which the cream was derived. If it were true that they are commonly present in cream, but have hitherto been rendered innocuous by boric acid, then it would be difficult to explain why no milk-borne epidemic of paratyphoid has been recorded in recent years, for no preservatives have been tolerated in milk itself since 1912. This is not to say, of course, that cream, like other foods, may not be accidentally contaminated after separation. Five years ago a big epidemic owed its origin to ice-cream which had been cooled in filthy surroundings.

The paratyphoid outbreak has been confused in the public mind with a group of cases of food-poisoning among the London police force, leading to the death of a constable. But although they were coincident in time the two epidemics were fundamentally different in nature. The usual symptoms of infection with so-called food-poisoning bacilli are vomiting and diarrhœa, the excreta often being blood-stained. There is evidence of intense toxæmia, and the rapid onset, perhaps with prostration, is in marked contrast with the slow and mild development of illness due to paratyphoid-B. Acute enteritis following the ingestion of food used to be described as "ptomaine poisoning," when it was supposed that the symptoms were due to substances produced by the decomposition of proteins, but it is now recognised that the symptoms are due to the multiplication of organisms of the food-poisoning group within the intestine, and in severe cases within the blood stream. The food-poisoning bacilli occurring in preserved meats such as sausages, pies, and the like, may have come from an infected cow or pig, or from subsequent contamination of healthy meat. The meat or food may not present any unusual features either to the taste or smell, although there can often be isolated from it an organism identical with that obtained from the sick individual.

All these infecting agents, paratyphoid bacilli and the food-poisoning organisms alike, however different may be their results clinically and epidemiologically, are closely related and belong to the salmonella group, which comprises a number of organisms which cannot be distinguished from one another under the microscope. Their biochemical characters are also similar and separation of members by fermentation tests is not possible. They differ in their serological relations, but even here the group relationship between certain types may be so close as to demand complicated methods, such as agglutinin-absorption tests for their identification. Of the three types of paratyphoid bacilli, "A" does not occur in this country, "C" is met with occasionally, while "B" infections are common, and in recent years have assumed a greater relative importance than typhoid fever. The food-poisoning bacilli comprise: The *B. enteritidis* of Gaertner, which was found in the recent police cases, and the *B. aertrycke*, the commonest food-poisoner in this country, of which at least four types have been described. All these agree in the essential characteristics that: (1) they multiply in food with great rapidity, especially during warm weather; (2) during their growth in food they produce no physical changes visible to the naked eye; and (3) the toxins produced are highly resistant to heat.

EXPERIMENTAL DENTAL CLINICS.

IT is generally agreed that in schools and industrial enterprises the dental clinic has proved its worth, and the Minister of Health has taken power, under the Amending Act, to set up a number of experimental clinics for dental treatment under the National Health Insurance scheme. This experiment has a significance both for medical and dental practitioners, since their interests under the Acts are closely related.

The amount of dental additional benefit distributed has steadily increased during two valuation periods, but it seems certain that its present partial and conditional application will extend over the period of the third valuation which is approaching. Notwithstanding the fact that nearly £2,000,000 per annum is available for the purpose, the present scheme is far from covering the entire field. All insured persons are not yet entitled to the benefit; those who are eligible are called upon to pay a large proportion of the cost of treatment, and none can claim it during those important years of adolescence from 16 to 21 years of age. If we ignore these serious deficiencies, it must be admitted that the scheme has been largely successful. A satisfactory system of dental service has been evolved and maintained on a voluntary basis, and this is especially noteworthy because in the original Act there was little provision for regulating the administration of additional benefits, and consequently the conditions of service—including the delicate matter of remuneration—had to be negotiated by conference between representatives of the dental profession and of approved societies in an atmosphere of imperfect mutual confidence. As it now stands the scheme is applicable to England, Scotland, and Wales. It is managed by a Dental Benefit Joint Committee consisting of equal numbers of dentists and approved society representatives, with subsidiary committees for interpretation, investigation of disputes and for appeals; there is a Regional Dental Officer service, and there is even a disciplinary tribunal consisting of a barrister and two dental assessors. No panel in the medical sense is at present

in existence, but there has been no difficulty in securing the necessary service, the insured person being permitted to consult any dentist who is prepared to give the treatment on the agreed conditions.[1] A few approved societies have caused trouble by refusing to take part in the scheme, and their efforts to secure treatment for their members at fees lower than those of the agreed scale have had a disturbing effect. There have also been the inevitable clashes caused by lay officials who considered that control of the funds gave them the right to interfere with the professional discretion of the dentists. The latter, on their part, have occasionally shown an unfortunate sensitiveness as well as a somewhat irritating tendency to ignore agreed conditions. But, on the whole, the method of giving treatment through the agency of private dental practitioners seems to have justified itself, and this method is likely to remain the chief means for administering this important benefit. The demand for dental clinics has thus no warrant in any failure of the present system.

By no means new, the suggestion that clinics should be established was familiar to those who had to deal with the approved societies during the first valuation period, when it was put forward by certain officials with the frank intention of getting more effective control over the dentists they wished to employ. The idea was to place one or more dentists in operating rooms in proximity to the offices of the approved society, which would itself settle conditions of service, supervision, and remuneration; in short, it was desired to apply to dental insurance practice the methods of the pre-insurance "medical club" system. When later, on the institution of the present Dental Benefit Joint Committee, the Minister of Health asked the Committee to inquire into "the possibility of the institution of clinics for dental treatment in particular areas and the desirability of encouraging steps to this end on the part of the dental profession," the earlier attitude towards the clinic question was largely abandoned, and stress was laid on the necessity for obtaining for insured persons a uniform standard of dental treatment in return for the payment of a uniform scale of fees. Attention was drawn to the advantages of large establishments, fitted with equipment and apparatus for special forms of diagnosis and treatment, and having facilities for team-work such as were not generally available in private surgeries; the clinic, it was expected, would also act as a propagandist centre for dental hygiene. The setting-up of such institutions is, however, only possible in populous areas, and preliminary inquiries on initial cost and running expenses do not encourage the idea that the present cost of treatment would be materially reduced. Nevertheless it is clear that clinics might play a useful though limited part in the future treatment of insured persons, and the assurances about their control, given by the Minister, and the actual embodiment in the Amending Act of the principle of free choice of dentist, have gone a long way towards reconciling the dental profession to an experiment of which it had been suspicious, as was hardly surprising. It must not be forgotten that the present position of the profession, of whose members only about one-half possess qualifications obtained after recognised courses of study and examination, necessarily results in a certain inequality of service available to those who get their dental treatment under the National Health Insurance scheme. The experimental clinics will test the possibility of providing a high standard of dental treatment in circumstances under which, otherwise, it may not be always available. If insured persons, of their own choice, attend them in sufficient numbers, and if the treatment given in the clinics is maintained at the level of excellence which is contemplated, their establishment will be justified from the standpoint of public health, and, in any case, the experiment, with all its results made freely available to interested parties, cannot fail to be useful.

[1] These are set out, together with full information on the working of the scheme, in a Dental Benefit Handbook compiled by the Dental Benefit Joint Committee and obtainable from H.M. Stationery Office at a nominal cost.

NON-PULMONARY TUBERCULOSIS.

SEVERAL important issues are raised in the papers in our present issue, by Mr. J. T. MORRISON on human and bovine types of tuberculosis in man, and by Dr. C. O. STALLYBRASS on the sources of infection. Both deal with non-pulmonary tuberculosis, a type of the disease which is all too often neglected in discussions on infectivity. Mr. MORRISON'S inquiry concerns the effects of inoculating guinea-pigs with material from tuberculous lesions, with a view to correlating clinical and bacteriological findings, and in almost one-third of the cases he found that this test was negative. For various reasons it is considered that failure to produce tuberculosis in the experimental animal was not due to the paucity of organisms, nor to a high state of immunity as reflected in the clinical course of the patient's illness; but rather to local conditions, such as the presence of fibrosis in the lesion from which the material was obtained. This view was supported by the long history of some of the cases, and seems by no means unreasonable, since it is well recognised that fibrotic and calcified foci are least likely to yield tubercle bacilli on animal inoculation. It would be a valuable aid to the elucidation of this point if material were inoculated from different portions of the lesions and at different times in the history of the same patient—i.e., in the early active stages and again in the later quiescent stages. An investigation into the human and bovine origin of these cases showed that failure to induce tuberculosis in the guinea-pig was as common with the one type of bacillus as with the other, so that the question of the relative toxicity of the two types of bacillus for the guinea-pig was apparently not considered to require investigation.

Mr. MORRISON raises a number of other questions on the regional distribution and clinical condition of the bovine and human groups. Tuberculous glands of the neck were found to be of bovine origin in 75 per cent. of cases, whilst the bovine bacillus was only responsible for 28 per cent. of the bone cases. These figures emphasise the need for a much more careful geographical survey of both bovine and human tuberculosis. Why, for instance, should Edinburgh have a high percentage of bovine lesions? Again, why should Jarrow, as shown by recent statistics, have a markedly higher total tuberculous incidence than Tyneside in general? Average figures for the country as a whole are of course of the utmost value, but there is some danger in assuming that they are necessarily typical of local conditions, and in so doing a remedial local factor may be overlooked. Statistics, moreover, do not remain of permanent value. Are we not in danger of making false deductions, for instance, from figures of positive findings of tubercle bacilli recorded in milk and butter in periods before the war? Every generation ought to make its own investigation afresh.

There is need, too, in the case of bovine tuberculosis for a regional survey of dairies and milk supplies, and we believe that such a survey might show that the bovine bacillus is not so widely distributed as was at one time believed. On the clinical side Mr. MORRISON's inquiry shows that the history of onset of the disease was earlier in the bovine than in the human bacillus series. This again is important. It is likely that younger children, drinking more milk, are more prone to bovine infection than older children, but we have been led to believe of late that the human type of infection is also contracted during early years. Mr. MORRISON's figures do not quite bear this out as far as non-pulmonary tuberculosis is concerned. A study of family history and an inquiry into possible portals of entry were not very successful as a guide to bovine versus human infection, but the results of treatment in the two types of case were remarkable. In all the bovine cases traced the patients were in good health, whereas more than 18 per cent. of the human cases had proved fatal within three years.

Dr. STALLYBRASS, also dealing with Liverpool cases, gives the results of inquiries into 4469 non-pulmonary cases of tuberculosis. From his figures it appears that tuberculosis of bones and joints is relatively common in patients giving no history of exposure to a human source of infection, whereas meningeal and abdominal tuberculosis—and to a less extent tuberculosis of peripheral glands—was in excess in those giving such a history. These deductions have to be somewhat modified for children, but, broadly speaking, Dr. STALLYBRASS thinks there is a direct contradiction between the figures as analysed for exposure or non-exposure to a possible source of human infection, and between the well-known results of bacteriological investigation. We are not so sure that exposure to human infection can be taken as a crucial test of invasion by the human bacillus. The tubercle bacillus is a slow starter, and the race is not always for the swift; the history of human infection may well be overlooked. The significance of certain details of personal history often escapes even the most skilled questioner, whilst the primary case in the household may remain dormant, from the physician's point of view, for many years. Conversely, bovine infection is rarely in evidence. On the whole, therefore, we are inclined to place most reliance on the bacteriological findings, but Mr. MORRISON and Dr. STALLYBRASS have raised many interesting questions, and are to be congratulated on exploring the field of non-pulmonary tuberculosis as against the pulmonary type of the disease. Far too little original work has been done of late years in this field, and it may well be that investigation of this kind will open up new views on the prevention of tuberculosis, particularly as regards contacts, disinfection, the milk problem, and the like. A large proportion of our national health budget is devoted to tuberculosis, and the elucidation of these questions may result in saving of money.

DONATIONS AND BEQUESTS.—The late Viscount Hambleden, among other bequests, left £5000 to King's College Hospital.—Mr. E. F. Goulburn, of Southport, left, subject to his wife's interest, £2000 to the Victoria University of Manchester to be applied for research purposes in connexion with megrim as affecting humanity, and £500 to Manchester and Salford Playing Fields Association.—Mr. Evan Lewis, Swansea, left £1000 to the Swansea General Hospital, to endow a bed.—Mr. W. R. Morris, head of the firm of Motor-car manufacturers at Oxford, and President of the Infirmary, has promised a gift of £38,000 for the extension of the Radcliffe Infirmary, Oxford. The gift will be used for the building of a new maternity home.—Mr. Tom Jackson, of Heaton, Bolton, left £1000 each to General Fund of the Victoria University, Manchester, the Bolton District Nursing Association, Dr. Barnardo's Homes, and the London Missionary Society.—Mr. Ernest George Wragg, of Ranmoor, Sheffield, left £1000 to the Jessop Hospital for Women to endow a bed in memory of his wife, £1000 to the Rotherham Hospital for the endowment of a bed in memory of his parents, and £500 to the Sheffield Children's Hospital for the endowment of the "William" cot.

Annotations.

"Ne quid nimis."

HEALTH HAZARDS IN INDUSTRY.

RECOGNITION is given in the United States to the social importance of the Registrar-General's Decennial Supplement dealing with Occupational Mortality,[1] by the devotion of a whole Public Health Report[2] to a summary of its facts and deductions. We are thus afforded an opportunity of knowing how others regard the data and their presentation. America possesses no comparable material—nor, indeed, has any other country; and turns with avidity to our occupational mortality-rates as being exceptionally suggestive. The social distribution of mortality, portraying the influence of financial standing upon disease, has little appeal to the United States, except as introducing an element of uncertainty into occupational environment. Possibly a country so prosperous as the United States finds even its lowest social class hardly at all hit by the dysgenic influence of penury. The association is noted of such digestive diseases as diabetes and diseases of the liver with financial capacity for over-indulgence in dietetic indiscretions. Then attention is devoted to specific occupational comparisons in the search for clues to hidden industrial hazards. Here the significance of dust as a cause of tuberculosis, especially of silica dust, is stressed. The evidence adduced receives synchronous support from research just published by the Metropolitan Life Insurance Company of New York,[3] wherein the proportion of deaths from tuberculosis for certain occupations with a silica dust hazard is shown to exceed the average for all males: for metalliferous miners by 83 per cent., for pottery workers by 77 per cent., and for stone cutters by 44 per cent. A point is made that where this specific hazard exists there is a tendency for the phthisis mortality to rise steadily with age, and so present a form of curve unique for this cause of death. The facts are carefully examined as to mortality due to all other respiratory diseases. Occupations with high rates are placed in five groups: one is exposed to dusts; a second to high temperatures—e.g., furnacemen; a third to inclement weather—e.g., dock labourers; a fourth contains rejects from other trades—e.g., costermongers; and a fifth includes the alcoholics. In this connexion the incomparability of death-rates in the two countries ascribed to chronic bronchitis receives attention. In the United States certification of chronic bronchitis is discouraged, so that in New York medical certificates stating chronic bronchitis as a cause of death are sent back for revision. Hence bronchitis death-rates are usually about one-fourth those in England and Wales; while cardiac death-rates are proportionately swollen, since English bronchitis becomes American myocarditis. Direct occupational risks, however, affect a relatively small group of the working population, while the conditions of life implied by various occupations exert subtle and pervasive influences on mortality in many indirect ways. The British data are recognised as providing evidence of the existence of such influences.

INFLUENCE OF POSTURE ON RENAL FUNCTION

THE relation of posture to albuminuria in susceptible subjects has long been recognised, and at one time came in for a good deal of investigation, but evidence on the effect of postural changes upon the renal function is still scanty. Exactly a quarter of a

---

[1] Registrar-General's Decennial Supplement, England and Wales, 1921, Part II., Occupational Mortality, Fertility, and Infant Mortality. H.M. Stationery Office. 1927.

[2] Public Health Report, No. 25, vol. xliii, June 22nd, 1928. Washington.

[3] Deaths from Tuberculosis in Dusty Trades. Statistical Bulletin, Metropolitan Life Insurance Co., vol. ix., No. , June, 1928.

century ago Linnoisier and Lemoine, using the methods then in vogue, adduced good evidence of an increase in the activity of the kidney when the body was recumbent, but in spite of the development of new methods of investigating the renal function their results seem to have gone unconfirmed. N. Cordero and M. H. Friedman,[1] working in the Physiological Laboratories of the University of Chicago, have now reinvestigated the question, using means of the phenolsulphonephthalein test of Rowntree and Geraghty. They employed two normal subjects for their experiments, which extended over seven months, and their results show clearly a diminution of excretion of the dye in the upright and an increase in the recumbent position. They were further able to demonstrate corresponding alterations in the excretion of water. A large body of evidence goes to show that the excretion of phenolsulphonephthalein runs parallel to that of nitrogenous bodies in the urine; Linnoisier and Lemoine demonstrated a decrease in chloride excretion in the upright position and an increase in the recumbent. In view of all these facts the assumption seems fully justified that the recumbent position favours, while the upright inhibits, renal activity. The why and wherefore of this phenomenon remains as obscure as it was when Linnoisier and Lemoine[2] originally produced the theory of torsion of the renal pedicle resulting from erect posture. The American investigators suggest that increased urinary excretion in the recumbent position may be due to increase of the capillary bed, brought about by vascular dilatation. Such a dilatation may depend not only on the recumbency, but also on the general toning-down of nervous activity, such as precedes sleep. In support of this they adduce the fact that in one of their subjects, who was of a nervous and excitable disposition, the influence of change of posture was less than in the other whose nature was more phlegmatic.

THE BROAD TAPEWORM IN NORTH AMERICA.

IT was predicted over 30 years ago that *Diphyllobothrium latum* would become endemic in the upper peninsula of Michigan, seeing that its population contained immigrants who retained their Baltic habit of eating uncooked fish, fresh, dried, smoked, or cured. The prediction has proved correct, and T. Vergeer[3] has been investigating the steps by which this established infection is being maintained. Pike are almost solely implicated as the second intermediate host, that directly concerned in infecting man. They are in the main migratory, passing from the Great Lakes into the rivers to spawn, and in this way reaching Portage Lake in the Michigan Peninsula, the spot where infection is greatest. One infected fish has been caught in Lake Superior, 20 miles from the mouth of the Portage Canal, a distance which marks the limit of the area investigated, so far as Lake Superior is concerned. The local crustacean intermediary has not been determined. That the matter may come to have a more than local interest is suggested by the statement that 7,000,000 pounds of pike belonging to the species which are locally infected were imported into the United States from Canada in 1924, the last year for which figures are available, mostly fresh and unfrozen. It is concluded that it is necessary that these imported fish should be thoroughly examined for the plerocercoids of *D. latum*. Knowledge of the extent, if any, to which they are infected would be valuable, but if a complete food inspection is implied, this would probably be incompatible with the continuance of the trade. Nor does there seem any justification for its institution in present circumstances, seeing that the human infestation is definitely associated with peculiar habits introduced by immigrants of certain nationalities, that it is reported as limited to the area where these habits exist, and that within that area, it is, in the experience of those in local medical practice, less common than it was 20 years ago. It is significant that all the pike, some 30, examined from Lakes Erie and Douglas, were free from plerocercoids of this cestode.

[1] Arch. Int. Med., 1928, xli., 279.
[2] C. R. Soc. de Biol., 1903, xlv., 466 and 605, and xlviii., 691.
[3] Jour. Amer. Med. Assoc., 1928, xc., 673.

RACIAL VARIATION IN THE SIZE OF RED BLOOD CELLS.

IT has generally been accepted that on the average the red cells of all the races of mankind are of the same size, but actual evidence of this has been wanting. Credit is therefore due to Dr. N. G. Winschnewsky[1] for adducing facts in support of this view. He has examined the red cells of 195 people of various races, all of whom had been domiciled for some months in Moscow, and he has found that the average size of the red cells in members of all the races tested falls within the accepted limits of normality. The extreme measurements of the diameter in the individuals examined were 6·64 μ and 7·83 μ, whilst for the different racial groups they were 7·14 μ and 7·34 μ. So far as it goes, this suggests that there is no appreciable difference between the dimensions of the red cells in individuals of different races living under the same conditions.

ACID DRINKS AND ENAMELLED VESSELS.

A FULL account of an interesting but rather alarming outbreak of sickness, which received some notice in the daily press, is given by Dr. J. A. Charles, assistant medical officer of health for Newcastle-upon-Tyne, in the current *Medical Officer*. Fortunately the investigation which followed the outbreak left no grounds of doubt as to the cause or as to the means of avoiding the possibility of similar occurrences.

A firm employing about 500 people were desirous, during the recent hot weather, of adding to the comfort of their employees by providing iced lemonade for their consumption. The "lemonade," like much of the drink provided under that name, was free from the characteristic acid of the lemon and its allies, citric acid; its place being taken by the usual substitute, tartaric acid. It is to the credit of the makers of the powder used that they called it "fruit crystals," and did not use any word suggesting that it was derived from lemons. The report of Dr. J. T. Dunn, who was called in to make an analytical investigation, showed that this was a perfectly harmless preparation, although a hasty test at the hospital, made when the first cases were brought in, led to the sufferers being treated for oxalic acid poisoning. An investigation of the circumstances attending the outbreak, which was rapid, both in the onset and the recovery of all the 70 odd persons attacked, showed that the crystals were dissolved in boiling water overnight in enamelled buckets obtained specially for the occasion, and extra sugar, over and above that in the crystals, added, with ice, in the morning. It may be noted, as having some small bearing on the case, that the amount of crystals used gave a solution of approximately double the strength of a liquid made strictly according to the makers' formula. Examination of the containing vessels, after the outbreak, showed that the enamel, where it had come in contact with the liquid, had lost its glazed appearance and that disintegrated enamel could easily be removed by rubbing with the finger. All the 12 buckets used were similarly affected, but a large metal bath in which a reserve supply was prepared and stored was not so attacked. Dr. Dunn found that the enamel of the pails contained antimony oxide equivalent to 5 per cent. of metallic antimony. This is by no means an unusual constituent of enamel glazes, and when vessels are intended for cooking the composition of the glaze

[1] Russian Jour. Trop. Med., 1928, vi., 141 (Abs.).

is usually so adjusted that the ordinary acid solutions likely to be used in culinary operations only remove inappreciable amounts of antimony in cases where that element is a constituent of the glaze. Antimony was also found in the "lemonade" taken from the pails. Owing to an oversight the liquid from the bath, which it was found was not enamelled with a fritted glaze, but had been painted with zinc white in linseed oil, was not examined, and it is not certain that any of the liquid in this was consumed, although at first there was an impression that those who drank only from this supply were not attacked by sickness. The lemonade from the pails contained 0·013 per cent. of metallic antimony. This, as Dr. Dunn points out, would represent in an ordinary 10 oz. tumbler gr. 0·57 of antimony, or gr. 1·52 of tartar emetic, whilst the emetic dose given in the British Pharmacopœia is gr. 0·5 to 1·0, so that drinking so little as one-third of a tumbler might be expected to cause sickness. No other heavy metals, such as arsenic or lead, were found in the drink, and the circumstances, including the symptoms observed, were all consistent with simple antimony poisoning.

It is unfortunate that so kind and thoughtful an action on the part of the firm concerned should have led to so much pain and inconvenience, but the tale serves to point some morals. Æsthetic and, perhaps, even common-sense considerations seem to suggest hesitation in adapting utensils designed for one purpose to another. The German makers of slop-pails, in glazing their interiors with a rather low-grade antimonial enamel, could hardly have foreseen that in the pioneer country of sanitary science they would be used as containers for beverages. Possibly, having regard to the adaptable character of the Briton, it might be desirable for such vessels, when sold, to bear a label: "not to be used for food or drink." Occurrences of this kind should receive the widest publicity; in fact, there should be some means whereby brief warnings could be compulsorily published in all newspapers. Further, some international standard for food containers might well be considered, as apart from acute visitations of the kind described, it is surely undesirable that the human body should become a receptacle for traces of antimony, tin, lead, arsenic, and other heavy metals. Last week 30 out of 60 of a party of boy scouts and girl guides were suddenly taken ill after having been regaled with cakes and lemonade, and were unable to return to camp until next morning. It is legitimate to wonder whether this outbreak was due to the same cause as the Newcastle one.

THROMBOSIS OF THE SPLENIC VEIN.

THE diagnosis of splenic anæmia is often made in cases which conform only vaguely to what many authorities regard as at best a vague disorder. From the mixed collection of cases grouped together under this name certain examples of thrombosis of the splenic vein have been separated off, principally by Wallgren, whose original paper has already been noticed in our columns.[1] At the discussion on chronic enlargements of the spleen in children, at the British Medical Association's meeting at Cardiff, Dr. Robert Hutchison referred to the occurrence of this condition in children, and described a case of his own; while in a recent article[2] G. Westkott makes a further contribution to the subject. The essential features of these cases of thrombosis of the splenic vein are the occurrence of severe hæmatemesis in association with enlargement of the spleen—which enlargement is less during and immediately after the hæmorrhage—and the absence of any evidence of cirrhosis of the liver or other cause for the symptoms. Westkott had under his care a girl of ten who was admitted with a profound anæmia, due, he believes, to severe infection with the intestinal parasite, *Trichocephalus dispar*. There was a history of hæmatemesis before admission, and a severe repetition of this followed a blood transfusion while she was in hospital. Elaborate investigations were carried out which excluded other causes of splenic enlargement: the blood count showed a severe secondary anæmia with very slow gradual improvement, unlike that following a serious hæmorrhage. In Westkott's paper the part played by the parasitic infection is discussed at some length, and the relation between this and the thrombosis of the splenic vein which was diagnosed is also considered. Operation was not performed, so that confirmation of the diagnosis was not possible. It is believed that thrombosis in these cases is probably the result of some infection, although the possibility of its connexion with the severe loss of blood by the bowel due to the worm infection has also to be remembered. It may be that the primary fault in these cases of splenic anæmia is a thrombosed splenic vein, and the splenomegaly which follows this may be responsible for the anæmia and also for the character of the white cell count, with leucopenia, so frequently found. Westkott does not come to any definite conclusions except to confirm the idea advanced by Wallgren, that splenic vein thrombosis is a clinical entity. The case he describes opens up further possibilities as to the ætiology of the condition.

[1] THE LANCET, 1927, ii., 823.
[2] Jahrb. f. Kinderheilkunde, June, 1928.

THERAPEUTIC MIRACLES AT HEREFORD.

IN his History of Hereford Cathedral the late Canon Bannister states that, as a general rule, the miracles recorded in the "Lives" of mediaeval saints are vaguely described and poorly attested. But of those wrought at the tomb of St. Thomas de Cantilupe it seems that there exists an official account, drawn up by six lawyers after investigations made by papal commissioners. Two of these—Ralph Baldock, Bishop of London, and the Bishop of Mende—came to Hereford at the end of August, 1307, and stayed till Nov. 16th, *omni die ex industria intuentes ecclesiam*. Pope John XXII., in the Bull of canonisation, declares that 17 miracles were thoroughly investigated and found to be *fidelibus probata testimoniis*. A large proportion of these 17 miracles were cures of cases of palsy, but three deal with cases of blindness, and Bannister says that the evidence for them is probably better attested than the evidence for marvellous cures at any other shrine. The fifteenth of the series concerns Agnes de la Brok, of the parish of St. Martin's, Hereford, cured of blindness on the Friday after the octave of Easter, 1287. One witness affirmed that Agnes was well-to-do, so that there was no apparent reason for her wishing to make money out of her infirmity. Several witnesses deposed that she had not in her blinded eyes, *vulnera, apostema, tumorem, maculam, vel aegritudionem vel aliquam apparentem laesionem*. This seems to have been a case of hysterical blindness. Last in the series of cures come two small boys, brothers, aged 4 and 5 years respectively, healed of their blindness, also in 1287. *Mali humores effluebant ex oculis, et aliquando claudebantur palpebrae dictorum oculorum: tunc ipsi oculi inflabantur, et putredine congregata in eis denuo palpebrae aperiebantur.* Obviously these were cases of simple catarrhal ophthalmia. Presumably Agnes and the children had died or passed out of ken during the 20 years intervening between their miraculous cures and the official inquiry, or their first-hand testimony would have been obtained.

Judged by modern standards one feels that the six lawyers who investigated these cures must have been very easily satisfied, but the inquiry was held upon the findings of papal commissioners, and when St. Thomas de Cantilupe, recently dead, was at the crest of his fame as a miracle worker. For this saint, one of the most celebrated of the Bishops of Hereford, died on August 25th, 1282, at Civita Vecchia. He is reputed to have been of a saintly disposition, and was certainly steadfast and unyielding in upholding the rights of the See. There is, so far as we are aware,

no evidence to show that during his life he had any active connexion with the healing art, but numerous cures were reputed to have been wrought at his shrine after and before his canonisation. He was elected bishop in 1275, succeeding Peter of Savoy (Aquablanca). He had served as Chancellor of the University of Oxford, and as Chancellor of England, under Simon de Montfort. He was stern in his resistance of encroachments on his liberties, upholding his rights in Malvern Chase against Gilbert de Clare, the Red Earl of Gloucester; disputing with Llewellyn of Wales and with Lord Clifford, the latter for cattle lifting. Lord Clifford performed penance and underwent a birching in the cathedral. The bishop's most severe wrangle was with his metropolitan, John de Peckham, over a question of testamentary jurisdiction. Excommunicated by the Archbishop, he went to Rome and secured from Pope Martin IV. a decree in his favour. On his way back he died, as stated above, and was buried in Florence. His bones were separated from the flesh by boiling and brought to Hereford and placed in the cathedral. His old enemy, the Red Earl, attended the ceremony, and at his approach, the episcopal bones were seen to bleed! Forty years later he was canonised. An enormous number of miracles resulted. More than 66 dead persons were restored to life. His shrine even acquired a sort of veterinary reputation, and Edward I. sent sick falcons to be cured at his tomb. The six lawyers, it will be seen, were asked to dismiss from their minds an extraordinary amount of influential matter before giving their verdict.

HEALTH TALKS.

IN the Public Health Section of the British Medical Association's Cardiff meeting Dr. W. W. Jameson dealt with the important and difficult subject of health education, particularly welcoming the use of broadcasting as a means to that end. He commended the suggestion recently made in *Public Health* (May, 1928) that the present method of broadcasting once a month a "health talk" lasting 15 minutes is unlikely to serve the cause of education so well as more frequent four-minute broadcasts on matters of special health interest at the particular moment. He also spoke of an agreement which had been reached with the General Medical Council in regard to the publication of health articles in the daily press, in which connexion a leading newspaper reported him as follows:—

> "It was now accepted that such articles should be submitted to the Chief Medical Officer of the Ministry of Health for his approval and that approval would be forthcoming provided the article was (*a*) for the public benefit, and (*b*) free from the taint of personal professional advertisement. Articles approved by the chief Medical Officer might be signed by the author and might then be distributed through one of the press associations."

These statements may easily be interpreted as an official decision on the vexed question of signed contributions by medical men to the public press, but the facts do not justify such a reading. For some time past the British Broadcasting Corporation has submitted to Sir George Newman, the Chief Medical Officer of the Ministry of Health, such talks on health as they were proposing to broadcast, with a view to assuring himself that the matter to be broadcasted was for the public benefit and free from the taint of personal professional advertising. It seems that the Central Council for Health Education, a recent development of the Society of Medical Officers of Health, proposed to distribute through the press associations a regular series of articles dealing with health subjects, and asked Sir George Newman for his advice whether the publication of such signed articles would be regarded as unobjectionable by the General Medical Council if the authors were (*a*) senior whole-time medical officers of the public health service who in the ordinary course were not likely to apply for promotion to other appointments; or (*b*) retired medical officers no longer seeking professional employment. The Registrar of the General Medical Council, when consulted, thought it desirable that the same principles should apply to this special series of signed articles as to the special wireless talks, and Sir George Newman expressed his willingness to exercise the same censorship over the publication of articles of this kind as he has done in regard to broadcasting. This is, we understand, the position which has been reached at the moment.

MENTAL DISORDERS IN SCOTLAND.

THE record of last year's care of the mentally afflicted and deficient of Scotland [1] contains no mention of novel departures or striking events, but proves that the foundations of lunacy administration are being strengthened and that healthy ideas are gaining ground. The total number of persons under the Scottish Board of Control at the beginning of this year was 18,702, an increase over last year of 122; this increase is all in the pauper class of patients, the number of private patients having slightly decreased. The number of admissions to asylums was 3168, which is 133 more than in the previous year, but 458 less than the average for the previous quinquennium; 703 voluntary patients were admitted, and 815 were resident on Jan. 1st last. This figure shows a remarkable increase, the average for the ten years 1918–27 being only 409. The average recovery-rate on admissions in all institutions, with the exception of lunatic wards of poor-houses, was about 34 per cent (no general rate is given in the report), and the average death-rate was 8·5 per cent. Most of the deaths were due to diseases of the circulation and brain, and there were only seven suicides. The number of mental defectives on the register was 2915, the admissions being slightly less than in the previous year. In discussing the life of defectives in private dwellings one of the commissioners points out once more that strangers look after them better than their own relatives. This fact is well known to all connected with the care of the mentally afflicted, but its explanation is not at first sight obvious. A patient living with strangers may be removed, and guardians will make strenuous efforts to avoid the stigma which they consider this will entail. Parents, from whom the patient cannot easily be removed, are apt to regard themselves as infallible. Many of these parents, moreover, possess a low intelligence and a rudimentary idea of cleanliness. When aliment is stopped because the family's circumstances have improved or the defective has obtained employment, patients and guardians alike are generally anxious to be free from official supervision. These, however, are the cases in which supervision is most necessary, as the labour of defectives is liable to be exploited.

The Board refer to the success of the observation wards which several parish councils have established and which are conducted on hospital lines. Of 1240 patients who passed through those at Stobhill and Duke-street in one year, 788 returned to their homes without the necessity for certification. The Board are anxious to extend the scheme. As they remark, the Royal Commission of 1927 recommended that the functions of the Board of Control and the General Board should be extended to include all matters relating to mental health. The annual lunacy grant, which amounts to £115,000, is given to improve the care of the mentally afflicted, and this object, in the opinion both of the Scottish General Board and of all who are concerned with the problem, would be better accomplished if, instead of remaining as it is—a grant in aid of certified lunatics—it were given to the Board to use at their discretion for the good of all mentally affected persons other than defectives. It could then be applied to the source of the evil instead of to its full flood, and would be many times more effective.

[1] Fourteenth Report of the General Board of Control for Scotland, for the year 1927. H.M. Stationery Office. 2*s*.

CIVILIANS AND BOMBARDMENT FROM THE AIR.

THIS week's manœuvres over London and the home counties seem to show that complete protection of a large city from aerial attack is at present impossible. It is a military axiom that means of defence never lag far behind means of attack, but for the moment, given equal forces, there is evidently no way of preventing a capital city from suffering severely by bomb-fire. The contents of the bombs to be used in true warfare are a matter of conjecture, but there is little reason to doubt that poison gas would be freely employed, and it may be of interest to recall the steps that are recommended to neutralise its effects. These were set out recently before the Academy of Medicine in Paris by Inspector-General Sieur,[1] who summarised a scheme agreed upon by the International Red Cross for the protection of civilians. This scheme was drafted in 1925 by a committee of experts —chemists, engineers, doctors, administrators, and workmen. Recognising that it is impracticable to supply everyone with individual protective apparatus of the best kind, it divides the community into two classes, active and passive. Active members—police, firemen, first-aid workers, and the like—receive the best possible equipment; passive members are given cheaper and more simple appliances which may safeguard them under ordinary conditions, but they must chiefly rely on being protected collectively. As a gas attack is likely to include attack by explosives, small bomb-proof shelters should be made to accommodate not more than a dozen persons. Any room, it is stated, can be rendered proof against non-lingering gases by hanging its openings with fabrics steeped in appropriate solutions or specially prepared, but it is better to use tightly fitting panels and maintain, by means of artificial ventilation, a pressure slightly above that of the surrounding atmosphere. The air should be taken from as great a height as possible and filtered mechanically and chemically; in shelters to be occupied by children or the sick and aged there should be a supply of oxygen. Shelters are best established in cellars, and there should be a stout layer of impervious flag-stones or concrete flooring over each, and where possible on each floor of the building. Besides these refuges there should be first-aid posts, special hospitals, and means for the transport of injured persons. Lingering gas imposes a serious problem, as it is highly poisonous and may contain pathogenic organisms. All places contaminated should be immediately cleared of their occupants and disinfected, and the occupants should be taken for bathing and disinfection to special stations, and should be excluded from ordinary shelters. Food and drinking-water should be protected, and municipal water-supplies should be covered with an impermeable mineral flooring, whilst gas and electrical conduits should be guarded against explosives. These provisions, said Dr. Sieur, should all be made in peace-time by committees of military and civil authorities, with representative citizens, for each district. The first-aid corps—in this country presumably composed of ambulance workers and trained volunteers—should be distinct from the disinfecting corps, which should be supplied by the fire brigade where there is one, and recruited from volunteers and local sporting organisations where there is none. He states that the British Red Cross is already training its personnel on these lines, but obviously the population here is wholly unprepared for a modern air-raid, whilst neither individuals nor municipalities are likely to plan their undertakings with aerial warfare in view.

[1] Bull. de l'Acad. de Méd., 1928, 3e sér., xcix., 680.

GIFT TO RADCLIFFE INFIRMARY.—Mr. W. R. Morris, the motor manufacturer, has given £38,000 for the building of a new maternity home at this hospital. He is the President of the Governing Body.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT CARDIFF.

(*Continued from p. 302.*)

SECTION OF MENTAL DISEASES AND NEUROLOGY.

AUTO-TOXÆMIA AS A FACTOR IN THE CAUSATION OF PSYCHOSES.

Prof. W. WEYGANDT (Hamburg), in opening the discussion, pointed out that with the advance in the pathological anatomy of the central nervous system, it had become more apparent that mental derangements were cerebral diseases, and that a morbid influence on the brain was the cause of mental disorders. The biological investigation of mental derangements was all the more important as the morbid anatomy of the brain had not fulfilled expectations, nor had experimental psychology or psychoanalysis led to very definite results. Prof. Weygandt then considered in detail the forms of retarded development in relation to metabolism of the endocrine glands. Disturbances of the thyroid gland in childhood led to retarded growth and delayed or absent sexual development as well as to mental retardation. Treatment with thyroid relieved such symptoms; excellent results were also obtained in myxœdema. In Graves's disease removal of a portion of the gland by operation was an important procedure, but thymus and ovarian preparations had also been employed. The speaker referred to the fact that giantism and acromegaly were sometimes associated with idiocy, in addition to Fröhlich's syndrome. In such cases a primary disorder of the cerebral cortex was presumably present.

Prof. Weygandt considered that the thymus had also a relation to mental evolution. Klose had removed the thymus in young dogs and observed that the animals developed obesity and ceased to grow, became stupid, tried to eat wood and stones, and eventually died. H. Vogt had described thymic idiocy in a dwarf, aged 17, with flabby muscles, fragile bones, general tremors, and retarded general development. As regards the suprarenal glands, Addison's disease was sometimes associated with headache, depression, fatigue, insomnia, and deficient memory. Strictly speaking, there was no such condition as an uniglandular disorder, for after the loss of one endocrine gland, changes in the other glands would occur. In mongolism the physical signs were those of retarded development, and might be associated with signs of thyroid or pituitary deficiency. Kafka had shown that the serum in most cases gave a weak but distinct "decomposition" reaction (Abderhalden) of the pituitary gland. Also, the white blood cells were increased, while the viscosity of the blood plasma was decreased. Prof. Weygandt considered that mongolism was not syphilitic in origin. One of the most important problems in psychiatry was to determine the pathogenesis of dementia præcox (schizophrenia). Pathological changes had been found in certain cerebral cells, especially those of the third stratum of the cortex. The fifth and sixth strata might also show atrophic changes. The contention of Mott that degeneration of the spermogenic cells and Leydid cells was the basis of the disorder was not generally admitted. Prof. Weygandt considered that endocrine degeneration, as shown by Abderhalden reactions, was most important, although many held these reactions in doubt. If a disorder of metabolism, and especially of the endocrine organs, affected a brain rendered somewhat abnormal by heredity, conditions were favourable to the development of schizophrenia. Entirely different, in Prof. Weygandt's opinion, were the basic conditions of manic-depressive psychosis (cyclothymia). The inherited factor in this disease was paramount and could be traced in 90 per cent. of cases. There appeared to be no question of

an anatomical basis, and he considered that we could attribute little or no importance to the factor of autotoxæmia. There was present an instability of affective mind resulting from heredity and possibly connected with vasomotor variations.

Autotoxæmia was of considerable importance in true or idiopathic epilepsy as distinct from symptomatic epilepsy. In many cases it was possible to demonstrate anatomical changes. For instance, Weiner had described gliosis of the cerebral cortex, Chaslin alterations in the cornu ammonis, Speilmeyer leptomeningitis. Endocrine influences might also play a part, the suprarenal, thymus, corpus luteum, and possibly the pineal gland, all tending to increase the instability of the cerebrum and to predispose to convulsions, while the parathyroids, gonads, pituitary, and possibly the pancreas, decreased this tendency. Hepatic influence in mental disorders remained uncertain. Kirschbaum had described degeneration in the corpus striatum and pallidum in the cerebral cortex in association with acute yellow atrophy of the liver. Prof. Weygandt attached no great importance to bodily fatigue and hunger, in the production of mental disease, but insomnia might have a definite influence.

In summarising, Prof. Weygandt stated that in many cases of mental disorder considerably biological and biochemical changes occurred which could be explained by autotoxæmia. The facts discussed had also been applied to treatment. Preparations of thyroid gland were successful in the treatment of myxœdema and cretinism, while results in pituitary disorders had been obtained by X ray applications and glandular feeding. Malarial treatment, successful in many cases of general paralysis, had not yet been found to influence dementia præcox nor epilepsy. Both diagnosis and treatment demanded that investigation of the autotoxæmic influences in psychoses should be regarded as one of the most important researches in psychiatry.

Dr. F. A. PICKWORTH (Birmingham) brought forward some work which was being done in Birmingham in connexion with the joint Board of Research for Mental Diseases and the Birmingham Mental Hospitals. The question of focal and intestinal sepsis had been studied very carefully. They had found evidence of infection with organisms of the paratyphoid and food-poisoning groups which was considered to have a causal relation to focal sepsis variation in agglutinin response and metabolic disturbance. A special study had been made of the relation of sinusitis of the sphenoid to pituitary disturbance, and pituitary dysfunction might explain some of the symptoms of endocrine deficiency. Dr. Pickworth showed slides illustrating: (1) the sphenoid sinus containing pus, and demonstrating that the pituitary gland had very little protection from the organisms and toxins which invaded the damaged epithelium; (2) a perforation into the pituitary fossa from a sphenoidal sinusitis. Other slides illustrated actual infection of the pituitary fossa, and one showed a number of organisms in a large mass of colloid in the pituitary capsule, suggesting that abnormally large masses of colloid in the pituitary had relation to septic involvement of the gland. Given septic involvement of the pituitary, it was reasonable to suppose that septic products, or at least a perverted pituitary secretion, was able to reach brain tissue.

Dr. E. MAPOTHER (London) thought all were equally agreed that every mental process was only the subjective aspect of a bodily one which left traces and originated habits and reactions. As regards gross endocrine abnormalities and mental disorder, Dr. Mapother thought that the evidence suggested that in most cases, with the possible exception of the thyroid, the association was rather one of frequent occurrences than of causal dependence. He had known dystrophia-adiposo-genitalis coexist with perfect mental normality; similarly, giantism was only occasionally associated with mental defect. Concerning genital glands, he thought that, if we interested ourselves in evidence of functional disturbances rather than gross anatomical changes, the history given by many patients was significant. Sexual disturbances and the psychological reactions arising therefrom, appeared of more psychiatric importance than all the rest of the endocrine disorders. Such conditions as erotism and nymphomania on the one hand, impotence and frigidity on the other, were extremely common, and the reactions arising from these conditions were most important.

Dr. I. S. WILE (New York) considered that the terms toxæmia and psychoses were employed in too broad a sense. They could not disregard heredity, infections, &c. Endocrine disorders and psychoses might be due to a common underlying cause, such as syphilis; concomitant as in association with cerebral tumour and diabetes; or in causal relation as mental enfeeblement and athyroidism. It was necessary to show causal relationship rather than coexistence of symptoms. At present all phases of study were essential to secure material facts from which later generalisations might be made. For many years it would be advisable to accumulate data regarding heredity, infection, trauma, and metabolism. Equally important were the appreciation of the psychological and psychogenetic factors entering into psychoses in relation to toxæmia.

Dr. MARY BARKAS (London) advanced the view that the association of physical disorders with mental disease might be explained otherwise than as direct causes, and that the psychiatrist might promote the development of psychiatry far more by concentrating on the study of the mental processes of patients than by a flight into the laboratory. Dr. Barkas thought that plausible explanations of the association of bodily manifestations with psychosis could be offered. She believed that autotoxæmia and similar disorders might be related to mental disorder in the following ways: (1) as a precipitating factor; (2) as a source of mental stress; (3) as joint effect of some primary cause; (4) as chance concomitant; (5) as result of the mental and emotional or psychomotor disorder. It must also be remembered that while they were dealing with those cases of disordered bodily function which were insane, there remained in the general population far larger numbers suffering from similar disorders, but free from mental illness; the speaker held that it was for them as psychiatrists to investigate what were the other factors, lying perhaps in the inherited constitution and temperament, in the individual development of personality, or in the foregoing emotional situation of their patients, which had determined the mental breakdown. The physical disorder might have been the last straw, making a pre-existing burden of a stress intolerable, and its removal might make readjustment possible. Various endocrine defects might produce dwarfism, but many dwarfs were of quite normal mentality, notably achondroplasics, and some forms of pituitary infantilism. Where they were mentally abnormal, might we not equally well suppose that their mental symptoms were a reaction to their bodily abnormality, which produced a sense of inferiority or an attempt to over-compensate for this, cunning or suspiciousness, and an attitude of defence to make up for lack of physical strength, and a whole series of other mental reactions. Until we had studied these mental phenomena in sane and insane alike who laboured under endocrine disorder, we were not in a position to assert that mental symptoms, when found, were directly produced by the metabolic dysfunction.

Dr. R. D. GILLESPIE (London) said that the conception of autotoxæmia in this country had been restricted largely to conditions of supposed intestinal absorption. The bacteriology of the colon in persons mentally normal was in too vague a condition to make it safe to draw definite conclusions from a bacterial examination of the fæces in the psychoses. Similarly, regarding Dr. Pickworth's observations, it was

dangerous for him to argue from his interesting findings to the psychoses in general. Regarding intestinal toxæmia, clinical experience with Hirschsprung's disease showed that mental symptoms were usually absent in spite of the extreme intestinal stasis. Ulcerative colitis, in which toxic absorption certainly occurred, was not, as a rule, accompanied by mental changes, whereas mental symptoms often accompanied so-called mucous colitis, in which absorption was probably absent.

Dr. HELEN BOYLE (Brighton) looked at patients from the clinical side: What was the matter with them? What would cure them? How long would it be? It was encouraging that Prof. Weygandt mentioned recovery in dementia præcox, and clinicians would agree with him that some such cases appeared to recover. His paper suggested a hope that some test might serve to differentiate these cases from others. It was not satisfactory to assume merely that should recovery occur, the diagnosis was wrong. With regard to manic-depressive states, Dr. Boyle said that many patients seemed to show an association with Graves's disease. This was more obvious in the early stages, but even in confirmed cases the description of excitement, tendency pyrexia, rapid pulse, sweating, and other symptoms suggested hyperthyroidism. There was not infrequently an enlarged thyroid. When this phase subsided, the picture often suggested hypothyroidism—as though the thyroid was fatigued and could do no more. There was depression, weight increased, the patients were slow and weary, with lack of interest, and in exactly the reverse of their previous states.

Dr. E. GOODALL (Cardiff), the President, remarked that many acute and recent cases of mental disorder improved in large measure with a preliminary enema or colonic lavages. In Cardiff they had published from the Mental Hospital laboratory work upon the distribution of the various nitrogen constituents of plasma, cerebro-spinal fluid, and urine in some 40 (mostly recent) cases of mental disorder, and the results appeared to point to anomalies of protein metabolism. With regard to blood chemistry, the methods for the estimation of blood substances were at present far from adequate. Reliable methods for the estimation of glucose alone had still to be elaborated; also with cholesterol, the statements published regarding a diminution or excess of blood cholesterol in epilepsy and at the menstrual period were unreliable. Some 15 years had passed since Fauser published his results with the Abderhalden reaction in cases of dementia præcox and other mental disorders. His results at that time were mainly confirmed, and there seemed to be evidence that a positive reaction was obtained by Abderhalden's method with cerebral cortex and gonadal tissue in dementia præcox. Of late years one had heard and read little or nothing of the Abderhalden reaction in psychiatry, so that it was of interest to hear Prof. Weygandt's opinion that this method gives a positive result as regards blood and cerebro-spinal fluid in dementia præcox, not only of cerebral cortex and gonads, but often with thyroid and pituitary. If this were so, a means of diagnosis between true dementia præcox, and other mental conditions resembling it, should be established. The difficulty of carrying out the test no doubt accounted for its general non-employment.

CEREBRAL STATES CONSEQUENT UPON HEAD INJURIES.

A discussion on the differential diagnosis and treatment of these states was opened by Dr. C. P. SYMONDS (London). Apart from the immediate surgical risks of compound fracture, rupture of a meningeal artery, and subdural hæmatoma, the severity of head injury varied according to the nature and amount of damage sustained by the brain at the time of injury. When such injury did not prove fatal, there would result cerebral symptoms the differential diagnosis and treatment of which the speaker proposed to discuss. Concussion might be defined as a condition of subtotal cessation of cerebral function following immediately upon an injury, with subsequent complete recovery within 24 hours, at the end of which, in an uncomplicated case of concussion, recovery should be complete. The symptoms were probably due to temporary vascular embarrassment. Distinct from concussion, though often associated with it, was the condition of cerebral contusion. The symptoms of cerebral contusion depended upon two factors: (1) the effect upon intracranial pressure, and (2) the site of the lesion. The focal signs of the latter were those of cerebral disease generally. The effect upon intracranial pressure depended upon the amount of hæmorrhage and exudation. For the purposes of clinical description, Dr. Symonds distinguished between a major and a minor degree of contusion. The major form was almost always associated with concussion; after a few hours the patient partially regained consciousness, but instead of progressing towards normal, he remained stuporose, restless and irritable and might be noisy, hallucinated and even violent. This condition might persist for some days or weeks, the tendency being towards gradual improvement. Lumbar puncture and the application of a manometer might show the presence of increased intracranial pressure; the cerebro-spinal fluid might be blood-stained, indicating capillary hæmorrhage. In minor contusion, the injury might or might not cause concussion. It was possible for a glancing blow to contuse the brain, without loss of consciousness at the time of injury. Symptoms might follow directly upon the injury, but more usually developed after a latent period varying from hours to weeks. The three symptoms most constantly present were headache, giddiness, and mental impairment. A characteristic feature of the headache was its relation to alterations of posture. The mental symptoms consisted of defective memory, inability to concentrate, decreased emotional control, and mental fatigue. Apart from focal physical signs which were rarely encountered, there were other conditions such as epilepsy and permanent mental change which must be related to local damage. Minor degrees of mental impairment—e.g., memory defects—were frequent, but permanent mental deterioration necessitating institutional treatment appeared rare. Epileptic attacks might occur even in the early stages of a major contusion and were probably due to subarachnoid hæmorrhage; attacks developing after a latent interval of months or years were of more serious significance. Cerebral abscess following a compound fracture, and chronic subdural hæmatoma, although both rare, were two sequelæ of head injury which the neurologist was likely to encounter. In subdural hæmatoma the patient began to complain of headaches usually several weeks after the original blow. Other symptoms of intracranial pressure gradually appeared, with stupor and finally coma. Owing to the long latent period and possibly trivial nature of the original injury the diagnosis was sometimes mistaken. The cerebro-spinal fluid might be found to contain altered blood-pigment and flakes of fibrin. Finally, there was a considerable number of cases in which the disability following head injury was wholly or partly of a neurotic nature and usually based upon the problem of compensation.

As regards diagnosis, Dr. Symonds said that during the first 24 hours it was impossible to make a comprehensive diagnosis owing to the state of concussion masking what lay behind. If, however, after partial or complete recovery of consciousness the patient sank again into true coma, or paralytic signs developed, arterial hæmorrhage was almost certainly present. The absence of concussion did not exclude the possibility of symptoms of contusion or subdural hæmatoma developing at a later stage. Stupor and irritability after the first 24 hours indicated major cerebral contusion. A patient might apparently recover and yet develop symptoms of minor contusion after several weeks. Since the symptoms of minor contusion were as a rule unassociated with physical

signs, it was often difficult to distinguish them from those of an anxiety state. Of particular importance in the differential diagnosis was the character of the headaches and their relation to posture. In neurosis the headache was continuous rather than intermittent, had little or no relation to posture, and was aggravated by mental stress. In true contusion the headache might be associated with giddiness, also related to posture, retardation of mental processes and defective memory for recent events were valuable signs of cerebral damage. It was important to remember that the brain might be severely damaged without fracture of the skull or objective physical signs, and that, conversely, fracture of the skull was not in itself proof of cerebral injury. The signs of subdural hæmatoma were often those of cerebral tumour—papilloedema, hemiplegia, &c.—and the cerebro-spinal fluid might exhibit xanthochromia and fibrin flakes.

As regards treatment in major contusion, relief of intracranial pressure might be obtained, either by lumbar puncture repeated at two-day intervals, if necessary, or by intravenous injection of 50–100 c.cm. of 15 per cent. hypertonic saline. The effect of this latter was to cause shrinkage of the brain by absorption into the blood stream of extravascular fluid contents. The effect was temporary only and the procedure might have to be repeated at intervals of two days. An alternative method was to give a saturated solution of magnesium sulphate (3 oz. in 6 oz. of water) by the rectum; to be effective, this solution should be retained for half an hour. In a series of 80 patients with symptoms of cerebral contusion Dr. Symonds found that 18, or 22·5 per cent., stated that they had made a complete recovery. In cases of major contusion the chances of the patient being able to return to full work were less than 1 in 3, and there was the same chance of total incapacity. In cases of lesser injury, there was an even chance of the patient being able to return to full work, and a very small risk of total incapacity.

Dr. C. WORSTER-DROUGHT (London) entirely agreed with Dr. Symonds in his statement that the brain might be very seriously damaged without fracture of the skull, or indeed, evidence of bone injury. In assessing the effects and possible consequences of head injury, far too much stress was laid upon the radiographic appearance of the skull, and if negative, the cerebral injury was often assumed—not only in legal, but also medical circles—to have been slight.

In his experience, the after-effects of what has been described as major contusion were more often severe than not—and personally he would not have placed the rate of complete recovery in these cases as high as 22·5 per cent. Cerebral contusion might lead to localised adhesions between the dura, arachnoid, and cerebral cortex and so give rise to epilepsy—and all without X ray evidence of bone damage. This was strikingly illustrated in one case that came under his observation—a case also noteworthy on account of the excellent result of surgical treatment. A man, aged 28, fell, striking his head on the junction of two tram lines. Three years after the accident his first epileptic fit occurred, there being no previous history of epilepsy. Examination showed a scar in the supra-occipital region, but no other physical signs.

The region of the scar was trephined, and when the piece of bone was removed, the dura on incision was found to be adherent to the underlying cortex. Dr. Worster-Drought had had this patient under observation since the time of operation—six and a half years—and no further epileptic attack had occurred; the patient returned to work and was in excellent health. Equally successful was another case of traumatic epilepsy, due to a lesion that might be described as unusual form of subdural hæmatoma in the posterior parietal region. An interesting point was how long after a head injury could epilepsy appear? In his experience, it had been common for epilepsy to appear three or four years after the accident, and he had met with cases in which the first epileptic attack had occurred 10 and even 12 years after the head injury. As regards treatment of traumatic epilepsy, the conclusion was that in the presence of definite evidence of the site of injury, such as a scar, &c.—even if radiographic appearances were negative and in the absence of other localising physical signs—operation was worth while. He would not advise operation in the absence of physical signs or of some evidence indicating the site of injury. The mental sequelæ of cerebral contusion were often peculiar. One somewhat unusual effect was complete and apparently permanent inability to perform mental work, of which Dr. Worster-Drought gave examples.

Dr. Worster-Drought considered that head injuries in the left frontal region were the most serious as regards prognosis in respect of mental changes. A condition of dementia might result from damage in this situation. He had seen such cases, and one example he described. In view of the fact that W. E. Dandy, in America, had recently excised the right cerebral hemisphere in man without, it was reported, the patient showing evidence of mental change, such injuries to the left frontal region were of interest in its possible localisation of the main seat of intellectual activity. As regards treatment, Dr. Worster-Drought was not convinced of the practical value of intravenous injection of hypertonic saline. The relief of symptoms afforded was somewhat uncertain and transient. He mentioned experiments supporting this contention. He was inclined to regard lumbar puncture, repeated if necessary, as the best means of relieving intracranial pressure. The continued administration of saline substances either by the mouth or rectum might, however, also be of value. For chronic and persistent headache following head injury, when repeated lumbar puncture failed to give permanent relief, Dr. Worster-Drought was in favour of sub-temporal decompression. He had seen several cases in which this operation had given excellent results.

Dr. WILE remarked that in children cerebral contusion might lead to changes in personality accompanied by delinquency and epileptic equivalents, resembling some of the sequelæ of encephalitis lethargica. It was necessary carefully to distinguish the headache, giddiness, and various mental disabilities following minor contusion from psychoneurotic symptoms. It was important to apply psychological tests in determining defects of memory, whether visual or auditory, for recent or remote events. The relation of cerebral injuries to later educational disabilities could only be determined by more thorough psychological investigation. Traumatic neuroses might be exaggerated in frequency, but it is wise to be certain that minor mental symptoms were not functional before suggesting that they were the residua of organic disease or cerebral injury. He agreed that emphasis was necessary upon the statement that fracture of the skull was not proof of cerebral damage, and that, conversely, damage of the brain might exist without a fracture of the skull. In order to interpret the actual state of a patient following cerebral injury, it was necessary to know if he returned to his earlier occupation, or was subject to further re-education, or was obliged to change by reason of changing industrial conditions.

Dr. GILLESPIE said that the classical psychotic syndromes had no definite ætiological relationship to trauma, and certifiable insanity rarely occurred as the result of head injury. In some cases that had been recorded other factors had been prominent, such as alcoholism, and heredity. Several forms of late after-effects could be distinguished, including traumatic mental enfeeblement and behaviour disorders. The chief difficulty arose in the diagnosis of these defect-states from those of psychoneurosis; nevertheless definite criteria existed, such as slowing of thought, attention defect, and mood disorders. Also the

patient should invariably be considered as a whole, especially his previous personality.

Mr. WILFRED TROTTER (London) said that until recent years a whole train of symptoms following head injury had been regarded as vaguely due to hysteria, malingering, &c., but that such symptoms had been brought under scientific observation and were no longer so vague and indefinable. It was possible to distinguish as precisely as anything in medicine a form of amnesia that was characteristic of true concussion. This was retrograde amnesia—a loss of memory for events preceding the accident, the patient having no recollection for anything that occurred during the 15 to 20 minutes that preceded his head injury. A further point of importance in diagnosis was that in the headache following minor contusion the patient when free from such headache felt perfectly well; this was not the case with the psychoneurotic.

For intractable headache following minor contusion a decompression operation was indicated. In major contusion, Mr. Trotter doubted if one was justified in leaving the brain in a seriously congested condition over a long period. He advocated the special operation of making a small opening in the skull to interrupt the vicious circle of compression.

Dr. D. MCALPINE (London) confined his remarks to the question of treatment. Increased intracranial tension was brought about by traumatic œdema or hæmorrhage, or a combination of both. Œdema resulted in a general enlargement in the size of the brain which tended to bring its surface close up against the dura. The effect of this was to hinder in varying degrees the absorption of the cerebro-spinal fluid into the venous sinuses, but as the cerebro-spinal fluid continued to flow from the choroid plexuses and accumulated in the ventricles and basal cisternæ, more and more pressure was brought to bear on the medulla until it became paralysed. In some cases, therefore, traumatic œdema resulted in death from medullary compression, and this was a fact that could not be overlooked from the point of view of treatment. Lumbar puncture afforded an easy means of reducing the tension, and was practically free from danger in cases of head injury, excepting in the stage of shock. As long ago as 1905, Quincke pointed out that in brain injuries the estimation of the cerebro-spinal fluid pressure was of importance, and that the best results were obtained by drainage. Until recently little importance had been paid to the principles underlying this observation. A rise of blood pressure accompanying intracranial tension was true only of the late stages of medullary compression, and should not be relied upon as an early sign. The only sure guide to the tension of the cerebro-spinal fluid was the manometer. The normal reading of the cerebro-spinal fluid pressure lay between 6 and 8 mm. of mercury. When the stage of shock following a head injury had passed, and no immediate surgical interference was called for, lumbar puncture should be performed and the tension of the fluid measured. If this was raised, sufficient fluid should be allowed to drain away until the tension was reduced to just below normal. The puncture should be repeated at the end of 12 hours in any case of severity, and performed daily until the tension returned to normal. If after two or three punctures it was found that the tension was increasing, then the possibility of cerebral decompression should be considered.

Dr. G. RIDDOCH (London) said that it was important to separate anxiety states from those of post-traumatic defect. The latter were of the order of a mild dementia—deterioration of general mental capacity. The patient's symptoms tended to become worse towards the end of the day, whereas in anxiety states the symptoms were usually most pronounced in the morning. The symptoms were mainly those of lack in mental and physical efficiency and were an indication of the effect on the brain as a whole rather than a sign of local contusion. Mr. Trotter had suggested the term "post-contusional submentation" to indicate this condition. Dr. Riddoch considered that hypertonic saline was of value in relieving intracranial tension, but that the method should be used with discrimination; it should be given preferably per rectum.

Dr. E. MAPOTHER (London) was surprised that various speakers whose experience of head injury was larger than his own should have found acute and severe psychoses so rare a sequel of head injury. He described three such cases directly following severe motor-car accidents. The salient feature in all three was a manic state, a joyous satisfaction with self and circumstances and disjointed hyperactivity. This was associated in a manner that one did not see in ordinary mania with confusion. Disorientation and amnesia for current events was also present; in fact, all three cases somewhat resembled a combination of mania with Korsakow's syndrome. All the patients recovered within a few months. Their condition was certainly not of purely emotional origin, and the patients had never shown previously a neurotic or psychopathic disposition.

Dr. PICKWORTH said that the connexion between head injury and mental disease was found in local or general cerebral anoxæmia or the results consequent upon inadequate removal of metabolic waste products. There was a remarkable similarity in some of the mental symptoms which might occur in chronic subdural hæmorrhage, simple anoxæmia and anoxæmia produced by carbon monoxide poisoning. Almost any symptoms of mental disorder might be reproduced by this condition. A history of head injury was by no means rare in mental hospitals.

Mr. GEOFFREY JEFFERSON (Manchester) added his testimony to the importance of the condition of retrograde amnesia which Mr. Trotter had mentioned. Another point was the anatomical basis of contusional states, be they recent or remote. Histological study of fatal cases showed minute though widespread change. He believed that lesions of a similar but lesser degree existed in those patients who finally recovered. The outstanding feature of the finer changes in the brain tissue was cerebral œdema, so that the perivascular sheaths were distended or ruptured. The question of treatment was based largely on pathological anatomy and its physiological results. If gross hæmorrhage was present the treatment was obvious. It was the œdematous cases which presented the chief difficulty. A great change had occurred in the surgical treatment of head injuries, a change from indiscriminate surgery to one of almost complete conservatism. Mr. Trotter had done a service in voicing his doubts as to whether they were right in allowing patients to lie for long in a condition of restless unconsciousness, and there could be no question that judicious surgery held a place in treatment. If one could be sure that the brain was œdematous, hypertonic solutions (and 50 per cent. glucose rather than saline was preferable) should succeed. But if a temporary improvement was followed by relapse, decompression should be done.

Dr. R. FAGER (Exeter) stated that during the war he had had the opportunity of studying a large number of cases with mental symptoms of varying degree following head injuries. Headache was an almost constant and distressing symptom; usually, but not invariably, it was referred to the site of injury, and was aggravated by stooping. The pain might be so depressing in character that the patient sought refuge in alcoholic bouts and even suicidal attempts. Other common symptoms were restlessness, irritability, lack of concentration, and even hallucinations.

Epilepsy occurred four times more frequently in severe injuries than in those of a superficial character. Cases in which memory defect was a conspicuous feature were mainly in the frontal region, but there appeared to be no relation between the degree of amnesia and the severity of the injury. Mental symptoms were the direct result of the head injury in a small proportion of cases.

Early Treatment of Psychosis in Psychoneuroses.

Dr. Helen Boyle (Hove) said that the discussion divided itself naturally into two parts: (1) the early treatment of the individual, and (2) how we could best obtain it. It must be recognised that insanity began before a person was insane. Many, if not most, of the difficulties met with in education, criminology, religion, industry, and general medicine, could only be solved with the aid of mental medicine—an understanding of the mind of man, in health and disease. No doctor would admit that an understanding of the body in health was foreign to his purpose of grappling with disease. No doctor should any longer admit that an understanding of the mind in health was redundant, and still less of the mind diseased. The intricacies of its connexion with the body still needed further elucidation. The early treatment of recent cases in mental hospitals had improved immensely of recent years. The hospitalisation of asylums was progressing apace, but she wished to consider not the certifiably insane treated in mental hospitals, but the patients whom it was harmful to certify or who were uncertifiable, the large number of the maladjusted, the patients labouring under obsessions, phobias, inhibitions, and so on. These were the cases for whom early treatment was so necessary if they wished to prevent the faulty adjustments, criminals and others. Dr. Carswell was the pioneer who started wards for borderland patients in connexion with the poor-law, Dr. Boyle believed, in 1904. The Lady Chichester Hospital was the first hospital for these cases, and started in 1905. The pioneer in providing out-patient facilities was the late Dr. Rayner, who with energy and foresight, about 1889, induced the governors of St. Thomas's Hospital to open an out-patient department for early mental cases. Since then, many others had followed suit.

Still earlier than those cases they had been considering were the children who show maladjustments in school life or before, and for them the child guidance clinics offered useful help. They are, as before stated, the first line of defence. Two are already in existence in England, and an elaborate one in London is being planned with American help.

Finally, Dr. Boyle said that she would suggest that it was desirable: (1) that every general hospital should have facilities for treating early nervous and borderland patients; (2) that child guidance clinics should be available for the young maladjusted children and be under the charge of doctors; (3) that delinquents should have expert examination with regard to their mental adjustment—on the first offence—repeated if necessary; (4) that voluntary boarders be allowed in county mental hospitals; (5) that early insane patients should be able to be treated on two doctors' certificates; (6) that vocational guidance should be available for all who wish it—as at the National Institute for Industrial Psychology—as a preventive measure against maladjustments and unrest; (7) that every medical student should be obliged to devote some time to the study of all forms of mental disorder; (8) that examining boards should require evidence of knowledge of all forms of mental disorder. It was better to pay for this than for insanity, delinquency, unemployment, and industrial unrest.

Prof. Weygandt said that one of the chief difficulties was the recognition of pre-morbid cases. In the commoner types of mental disorders there was an inherited predisposition—e.g., schizophrenia, cyclothymia—and even in early youth latent symptoms might exist. These it might become possible to detect by biological and psychological methods. There had already been several attempts to investigate children liable to mental disorder. At Hamburg they had a clinic for the observation and treatment of psychopathological boys by specially trained medical men and teachers.

Dr. Wile said that the prevention of psychoses and psychoneurosis should be undertaken in childhood to be adequate. From experiences at his own clinic at the Sinai Hospital, New York, he had found that much of the work could be carried out in an out-patient department. The problems met with could be classified under the following headings: (1) social maladjustments, which grew out of social nonconformity; (2) inadequate and undesirable habit-formations—e.g., insomnia and night terrors; (3) personality trends—e.g., timidity, selfishness, and seclusiveness.

Dr. Mapother agreed that in smaller country towns an out-patient department or a ward might be all that was attainable, but it did not follow that such an arrangement was the ideal. In advocating the psychiatric clinic wherever possible as against the policy of a ward or department in a general hospital, he laid stress on points: (1) that it was wise not to rationalise into laws of nature restrictions and separations and vested interests which had really grown up from the absurdities of the Lunacy Act of 1890; (2) the tendency of every progressive country in Europe was towards establishment of special clinics; (3) detailed knowledge of attempts in Great Britain to establish psychiatric treatment in general hospital wards was evidence of their inadequacy.

Dr. Barkas said that it was too often assumed that early and recoverable cases were necessarily mild ones, not needing the resources of a mental hospital for their treatment; this was far from being the case, for it was just those eminently recoverable acute cases who broke down rather suddenly, without such prodromal signs as were likely to be noticed, who formed the group in which prognosis was best, while those of more insidious onset were, unfortunately, quite often the most intractable. An extension to all patients of the provisions now available for private patients, with adequate supervision by the Board of Control, a thing no general hospital was likely to welcome, would do much to supply all that was needed for the present. Child guidance clinics had shown how greatly the problem of the psychopathic child was bound up with social considerations, and how all-important was the social worker in the re-education of the family. The same applied to the adult neurotic; and Dr. Barkas believed that no clinic for either in- or out-patient treatment would be able to do satisfactory work unless it included a well-trained staff of social workers who could deal with the environment of the patient.

Dr. R. G. Gordon (Bath) considered that an intensive study of the personalities of individuals was necessary whether sound or sick, and that particular attention should be paid to the capacity and success enjoyed by adjustments to environment. If this was done he suggested that it would be found that the person who under certain conditions, whether of toxæmia, endocrine disturbance, mental conflict or emotional shock, broke down into a psychosis, differed in his "personality make-up" from another patient who under similar conditions developed a neurosis. Moreover, he would suggest that one of the chief differences was, that in the first case the personality had no real tendency to adjust to the environment, and that in the present state of our knowledge our efforts scarcely increased this adjustment. With greatly increased knowledge we might be able to foresee that under certain circumstances which might be avoided, "A" would break down into a psychosis of a particular kind, say manic-depressive insanity; "B" into a psychosis such as dementia præcox, and so on; while "X" would break down into a neurosis of a certain kind, say, an anxiety state; and "Y" would develop hysteria, and so on. He could not affirm too strongly that this was an ideal situation, and that at present probably no one pretended to be able to carry out such subtleties in diagnosis; yet increasing experience seemed to be pointing that way.

Dr. J. R. REES (London) said that there were comparatively few who realised that the moral disorders, the character and personality defects of childhood, were the forerunners of much of the mental disorder of later life. Psychology should be studied in the nursery and in the infant school, and the general practitioner was the ideal person to tackle this early period. He had the entrée to homes and the confidence of patients. He asked if the B.M.A. could not initiate a campaign of education. The mental hygiene movement in America did a vast and altogether admirable work which was practically left untouched in this country. The general practitioner, with his experience and balance, was well able to get hold of the essential facts that were known, and would in consequence be infinitely better equipped to deal with the earliest manifestations of trouble and to do preventive work of inestimable value. Clinics, early treatment centres, and child guidance centres must come, and it seemed to him essential that the profesion should have adequate knowledge if it was to coöperate adequately with these specialised institutions.

Dr. GOODALL (the President) said the delay in dealing with the recommendations of the Royal Commission on Mental Disorders in respect of facilities for early treatment was deplorable. He detailed the arrangements at Cardiff for dealing with early cases in an out-patient department of the Cardiff Royal Infirmary during the past seven or eight years. Dr. Goodall stated that the 30 to 40 per cent. of patients amongst the direct admission to the Cardiff Mental Hospital who were annually discharged within six months of admission could—the majority of them—be treated at a psychiatric clinic, quite apart from the lunacy laws as at present constituted, and all the drawbacks which those laws implied. His constant advice to the Cardiff Local Authority was to rigidly abstain from any addition to their mental hospital, and to concentrate upon provision, in conjunction with the Cardiff Infirmary, of a fully-equipped clinic in psychiatry.

Dr. DORIS ODLUM (London) desired to emphasise most strongly that the provision of a psychiatric out-patient department in association with a general hospital was most valuable, not only in the interests of patients, but also as a means of educating the public, nurses and doctors in other departments of the hospital. Adequate social service in connexion with such a department, and specially trained welfare workers were also essential.

Dr. W. A. POTTS (Birmingham) said that the two most important centres for early treatment to be carried out were: (1) the infant welfare clinic, which provided the earliest opportunity for the examination and training of the child; (2) the antenatal clinic, where the attitude of the mother, and also of the father, to life, and also to the child, might be investigated, and, if necessary, adjusted. It was necessary to correct any misunderstanding that might arise from what was said about the damage of a sentimental attitude towards delinquents, by saying that those who were engaged in work with delinquents were out for justice, and for an opportunity for developing and drawing out the diminished sense of responsibility many delinquents had.

Dr. R. S. ALLISON (Ruthin) referred to some physical aspects of the treatment of the psychoneuroses. From the physical standpoint the first essential after a careful history was a thorough physical examination, and following this, investigations along bacteriological, biochemical, and radiological lines. The object in making these investigations was twofold: (1) the search for toxic foci, (2) to ascertain the physical peculiarities of the patient. The teeth, the throat, the accessory sinuses of the nose, the appendix, the gall-bladder, the colon, the urine and fæces were commonly the sites of a latent infection. In many cases this might be only detected after a thorough investigation of the case.

Dr. C. FORBES (Aberdeen), speaking as a general practitioner, desired to support strongly Dr. Rees's suggestion regarding the education of the profession. The proposition should be urged by all who were interested in the early treatment of mental and nervous illness. There was a definite need for the institution of clinics as a medium not only of research and treatment, but also for the education of family doctors in the particular area served.

SECTION OF TUBERCULOSIS.

RELATION BETWEEN TRAUMA AND TUBERCULOSIS.

Mr. H. MORRISTON DAVIES (Ruthin) was in the chair, when Dr. NORMAN TATTERSALL (Leeds) read a paper on the relationship between trauma and tuberculosis from the physician's standpoint. He considered that inoculation tuberculosis, such as butchers' and pathologists' warts, and acute generalised miliary tuberculosis following such injuries as a blow on a tuberculous testis, forcible movement of a tuberculous joint, and operations on tuberculous glands came into the category of traumatic tuberculosis. In 300 cases of pulmonary tuberculosis he found six cases in which trauma was suggested as the exciting cause, and in four of these, very definite symptoms had bridged the gap between the injury and the onset of the pulmonary lesion. He regarded as satisfactory Parkes Weber's classification of such cases into (1) those in which no tuberculosis was suspected prior to the injury, and (2) those in which tuberculosis was known to exist before the accident. An injury rarely produced a state of lowered resistance to the implantation of tubercle bacilli, and the more probable explanation was that the injury had activated an existing focus of disease. To support this contention he instanced the work of Opie and others who had isolated tubercle bacilli from gland and lung tissue which showed no naked-eye evidence of tuberculosis. Further, accidental wounds in tuberculous patients healed readily. Although injury to the chest might give rise to any form of pulmonary tuberculosis, the disease did not necessarily start on the same side as the injury. Compression injuries were more potent in exciting pulmonary tuberculosis than penetrating wounds. The course of the disease subsequent to injury might be acute, subacute, or chronic. Such symptoms as pleurisy and hæmoptysis were of great importance in fixing the date of onset, but it was very important in the assessment of claims for compensation that "bridge" symptoms should be present between the injury and the diagnosis. He suggested the following questions as helpful in arriving at a decision.

1. Was the patient actively or passively tuberculous before the accident, and if the former, what was his expectation of life?
2. Is the fact of injury definitely established, and was it of such a nature as to be likely to damage an active or quiescent lung focus?
3. What period of time elapsed between the injury and the diagnosis, and was the period covered by bridge symptoms?
4. Is the present condition of the patient and the course of the disease such as might be expected if the injury had reawakened or aggravated an existing latent focus of disease?

Mr. ROBERT MILNE (London), in discussing the question from the surgeon's point of view, said that whereas trauma may lead to a wound and to the implantation of tubercle bacilli in the damaged tissues, weakness from unsuspected tuberculosis, as for example in the knee-joint, may also lead to an accident. In some cases trauma may give rise to an infection of the injured part with tubercle bacilli from the blood stream, but, in his opinion, the percentage of such cases usually given (30 per cent. according to some authors) was much too high. He would put it as low as 2 to 5 per cent. Modern diagnostic methods had shown that many of the so-called tuberculous lesions following trauma were

instances of non-tuberculous conditions such as tabetic spine, chronic traumatic arthritis, Kümmell's disease, Perthes's disease, *pied forcé*, fibro-sarcoma of the femur, &c. He illustrated these and other conditions by a series of lantern-slides. In conclusion, he said that injury to a tuberculous joint did lead to recrudescence of the disease, but emphasised his opinion that trauma was not a common cause of tuberculosis in cases where a quiescent focus had not previously existed.

Dr. OTTO MAY (Prudential) dealt with the matter from the point of view of accident insurance. He agreed with most of Dr. Tattersall's statements. Mr. Milne, he said, had shifted the discussion to another plane, and had maintained that we must question the diagnosis of traumatic tuberculosis in nearly every case. But the employer is still liable for compensation claims whether the condition is tuberculous or not, so that, in compensation cases, the exact diagnosis was not really a matter of first importance. Dr. May classified traumatic tuberculosis for the purposes of accident insurance and compensation under four headings: (1) recrudescence of a pre-existing focal lesion; (2) miliary tuberculosis following trauma at the site of a tuberculous focus of disease; (3) tuberculosis arising at the site of an injury without a history of previous tuberculosis; and (4) cases in which pulmonary tuberculosis arises after an injury to some other part of the body. In a court of law, he said, one can only give an opinion as to the possibility of the accident having caused the disease, but provided that one did not assume the pose of pontificial infallibility, a touch of dogma was of more practical help in the dispensation of justice than the cleverest exposition of scientific agnosticism.

During the discussion which followed the reading of the papers, Sir ROBERT PHILIP (Edinburgh) suggested two practical points in dealing with accident cases. In the first place, a series of radiograms of the affected parts and of the chest should be taken at short intervals and, secondly, many patients had cause to bless the accident, because it brought a smouldering tuberculous focus into view, and by early treatment and the care that was taken in compensation cases, many valuable lives were saved.—Dr. ALEXANDER BROWNLEE (Cardiff) thought that the percentage of cases following injury was higher than the figures given by Mr. Milne. In a series of his own cases he had found 32 per cent. of cases of hip disease, 33 per cent. of spine cases, 22 per cent. of knee cases, and of other joints 25 per cent. gave a history of injury. He agreed that it was doubtful whether trauma to a previously healthy person could set up tuberculosis in the injured part, but thought that probably the majority of the population was pathologically, although not clinically, tuberculous. "Bridge" symptoms were important in compensation cases, especially if occurring within six months following injury to the knee, within 12 months after trauma to the hip, and in the case of the spine, within two years. However, one could not dogmatise on this point.—Dr. CECIL WALL (London) said that repeated multiple minor traumata, fatigue, and mental anxiety could all help in the activation of a dormant tuberculous focus. There was little difference, he said, between minor multiple traumata and fatigue.—Dr. JAMES CROCKET (Glasgow) regarded both mental and physical strain as instrumental in exacerbating tuberculosis.—Dr. H. V. CANTOR (Cheshire Joint Sanatorium), in discussing tuberculosis following war injuries, said that the Ministry of Pensions did not consider claims in cases diagnosed as tuberculous within the last two years.

Dr. TATTERSALL, in reply, said that he was gratified that a blow had been struck against the theory that tuberculosis was implanted on injured previously healthy tissues. In reply to Dr. Cantor, he said that the Ministry of Pensions had been very generous in their treatment of ex-Service men.—Mr. MILNE did not agree with Dr. May that the diagnosis was not important in compensation cases. He regarded it as essential both from the point of view of treatment and of compensation.

FACTORS IN THE BIOCHEMISTRY OF TUBERCULOSIS.

Dr. L. S. T. BURRELL (London), in reading a paper on the therapeutic value of the heavy metals in pulmonary tuberculosis, referred briefly to the use of copper and lead, and to the reactions following the use of such metals as well as of other shock-producing agents such as serum, tuberculin, protein, sun rays, &c. In the use of gold, and especially of sanocrysin (double thiosulphate of gold and sodium) he emphasised the point that the reaction following an injection was similar to that produced by the other shock-producing agents, but that it differed from them in its effect, in that the reaction was followed by the disappearance of tubercle bacilli from the sputum, and by diminution in the amount of sputum. The chief indications for the use of sanocrysin were (1) in cases where the amount of sputum containing tubercle bacilli persisted in spite of other forms of treatment, and (2) in cases of bilateral disease, where it could be used in conjunction with artificial collapse of the more extensively diseased lung. He usually commenced with a dose of 0·1 g. followed three days later with one of 0·25 g. Then, at weekly intervals, he gave doses increasing from 0·5 to 1 g. until the patient had had 5 or 6 g. The complications, such as albuminuria, a metallic taste in the mouth, stomatitis, erythematous rashes, and febrile reactions, had not been serious or of frequent occurrence. In conclusion, he said that he regarded sanocrysin not as a specific against tuberculosis, and certainly not as a cure, but as a useful addition to other methods of treatment.

Dr. J. CLIFFORD HOYLE (Cambridge) read a paper on the serum calcium in experimental tuberculosis. Changes in the calcium metabolism had long been recognised to be associated with tuberculosis, and earlier observers had maintained that "demineralisation" occurred during the disease. No sound evidence existed for the belief that decreased calcium retention took place in tuberculous infections, except possibly in the terminal stages. This fact could probably be explained as being due to infection with secondary organisms. To support this view he gave the results of some interesting experiments carried out on rabbits. He had observed a striking difference between the serum calcium estimations when intraperitoneal as opposed to subcutaneous inoculations of bovine tubercle bacilli had been made. In the former the disease became generalised without an ulcer at the inoculation site, and in these cases little change was observed in the serum calcium curves, but in the latter where an ulcer infected with secondary organisms formed, the serum calcium fell steadily. If the ulcer healed, as sometimes happened, the serum calcium rose again, even while the generalised disease became steadily worse. Septic infection in previously normal rabbits also produced a considerable fall in the serum calcium.

Dr. W. H. TYTLER (Cardiff) gave the results of his work on the "tuberculin-active fraction of the tubercle bacillus." He referred at length to the work of previous observers, especially of Long and Siebert. His own work had been primarily concerned with the production of a highly active preparation for experimental work. His methods of preparation were, in principle, similar to those of other workers, and his product was not a newly discovered substance, but was a highly active fraction with some practical application. The substance, obtained by the method of which he gave full details, was non-dialysable, and consisted of protein with a small admixture of proteose. Then nitrogen content varied from 11 to 12·5 per cent. The active fraction used for skin reactions gave a more sharply defined reaction than tuberculin, particularly at low concentrations. It might be stored in dry form, was accurately

measurable by weighing, and was stronger than old tuberculin. He had no reason to believe that it would have any greater therapeutic value than tuberculins in general.

In the afternoon Mr. MORRISTON DAVIES and Mr. TUDOR EDWARDS gave a demonstration of the results of thoracic surgery, and later, at the Cardiff Royal Infirmary, showed a series of patients on whom thoracoplasty had been performed. Dr. PARRY MORGAN (Cardiff) showed his artificial pneumothorax apparatus fitted with a double manometer.

AFTER-EFFECTS OF SURGICAL PROCEDURES IN PULMONARY TUBERCULOSIS.

Mr. TUDOR EDWARDS (London) opened the discussion by reading a paper on the after-effects of surgical procedures in cases of pulmonary tuberculosis. He regarded the after-results as being due to a series of factors such as: (1) the right choice of cases, (2) the type and extent of the operation, (3) the anæsthetic employed, (4) the operative mortality and complications, and (5) the after-treatment. In discussing the choice of cases for operation, he said that the chief factor was the condition of the "better" lung, which should show no active disease for at least three months prior to the operation. In cases of doubt it was his custom to perform a preliminary phrenic evulsion on the more-affected side in order to test the capacity of the better lung to withstand the increased strain to be placed on it. In his experience there was a tendency to wait too long before the surgeon was called in. The chances of recovery by surgical measures diminished with the increase of the amount and activity of the disease in the lung. Surgical procedures in diseases of the chest had incurred a certain amount of unnecessary odium mainly on that account. Experience had convinced him that adequate collapse of the affected lung could be obtained by a preliminary phrenic evulsion and a subsequent two-stage thoracoplasty from the first to the tenth ribs posteriorly. In order to produce localised collapse, phrenic evulsion and pneumolysis were satisfactory operations. In tuberculosis, however, it was usually necessary to secure complete collapse. The best anæsthetic was a gas and oxygen combined with local anæsthesia. The operative mortality and the complications of thoracoplasty such as shock, pulmonary embolism, spread of disease in the opposite lung, and septic infection of the wound could be largely diminished by careful pre-operative and after-treatment. No complications had occurred in his cases of phrenic evulsion and apicolysis, nor had they required much in the way of after-treatment. In thoracoplasty, after-treatment is essential, an important feature being that the patient should spend from three to six months under sanatorium régime.

Dr. F. G. CHANDLER (London), in discussing the question from the physician's point of view, said that a physician, in recommending a serious operation, took a great vicarious burden on himself. He should ask himself the question, "Would I, if necessary, have this operation performed on a member of my family or on myself?" The surgeon's relationship to the patient was, in a sense, impersonal, and it was the physician who had to consider the operative risk, the possibility of after-pain and discomfort, and the ultimate result. In chest surgery there were peculiar difficulties. Problems of judgment arose as well as questions of technical skill. If it were possible, a combination of the physician-surgeon would be ideal, and there were indications that developments along these lines were taking place. The open operation for dividing pleural adhesions was, in his experience, usually followed by sepsis and empyema, although there was little disturbance from the actual operation. In phrenic evulsion the immediate risk was small, but some complications, such as hæmorrhage, hæmoptysis, air embolism, chylous fistula, pulmonary œdema, and injury to other nerves had been reported. He agreed with Morriston Davies that the operation was of undoubted value in basal tuberculosis and as an accessory operation in artificial pneumothorax. Apicolysis and pneumolysis were, from the physician's point of view, the operations of choice. The shock, after-discomfort, and operation mortality were negligible. A satisfactory packing substance had still to be found, but he was greatly interested in the possibilities of these operations. It was difficult to judge the merits of thoracoplasty, on account of the extremely variable results. The after-results could not be usefully discussed without a clear idea of the criteria of suitability and non-suitability. Of the cases suitable for the operation, he gave the following types: (1) If a successful artificial pneumothroax had been allowed to terminate with a recurrence of symptoms and re-collapse was not possible; (2) if an artificial pneumothorax was imperatively indicated in a case of progressive unilateral disease, yet by reason of adhesions, it was not possible to induce one; (3) if chronic unilateral disease was present causing distressing symptoms. The cases not suitable included: (*a*) those in which there was a suspicion of active or progressive disease in the "better" lung; (*b*) those in which the general resistance was poor; (*c*) those with fibroid phthisis with every prospect of a reasonably healthy life; and (*d*) cases with amyloid disease or tuberculous ulceration of the intestines. The operative mortality varied between 5 and 12 per cent., the after-pain and distress were frequently considerable, but the results of the operation were, on the whole, good. Surprisingly little deformity was produced. The result could not be guaranteed, but in some cases there was a prospect of complete and permanent recovery which no other method of treatment could procure. Oleothorax, although our experience of it was limited, would probably be of great value in preventing obliterative pleurisy in artificial pneu mothorax.

Dr. D. W. FENWICK JONES gave the results of 24 cases of thoracoplasty carried out at the North Wales Sanatorium. His general impression was, that while it was a desperate operation in advanced cases, it was a pity that cases of earlier disease were not selected for the treatment.—Dr. WALL said that the last stronghold of the physician had been taken by the surgeon, but he agreed that the results of chest surgery were good, and he looked forward to the establishment of the chest specialist who would be both a physician and a surgeon.—Dr. D. A. POWELL (Cardiff) remarked that we were at the beginning of an important operative era, in which specialism would be regional, and not divided into medicine and surgery. He was somewhat disappointed with the results of artificial pneumothorax, and hoped that those of thoracoplasty would be better.—Mr. MORRISTON DAVIES, in showing a series of photographs and radiograms of cases of thoracoplasty, pointed out in the photographs the negligible deformity as compared with radiograms of the same cases showing extensive collapse of the lung and the chest-wall. He regarded the one-stage operation as better than the two-stage, because the pulmonary collapse obtained was more complete, and also because the patient did not have to face the anxiety and shock of two serious operations. He pleaded for the establishment of operating theatres in sanatoria, and thought that in this respect the example of the Welsh Memorial Association might well be followed.

Mr. EDWARDS, in reply, said that after-pain was largely due to bad technique. An operative mortality of 12 per cent., taking everything into account, was not excessive.

TUBERCULOSIS AS SEEN BY THE GENERAL PRACTITIONER.

Dr. ANGUS KENNEDY (London), in opening the discussion, said there had been a surfeit of laudation about the success of the campaign against tuber-

culosis. In his opinion, the expenditure of time and money had not been justified. The mortality from tuberculosis in 1821 was 25 per cent., in 1871, 12 per cent. So that, at a time when no preventive measures had been taken, the mortality had fallen to half. Since then, with the advent of the campaign, the mortality had fallen only 3 per cent. He explained this as being due to the fact that tuberculosis was an epidemic disease and that, as in all epidemics, the virulence of the bacillus had been greatly attenuated until the disease was now very mild, and in fact endemic. In 50 years' time it might again become epidemic. Immunity in his opinion was inherited, and by way of illustration he cited his experience among negroes who had come to the East-end of London. In one half-caste family he had observed that the boys, who all had a touch of the "tar-brush," died from tuberculosis, whereas the girls, who had inherited mostly the characteristics of the white parent, were still alive. We should aim at producing a race immune from tuberculosis. Before people marry they should look into the family history as well as into the banking account.

Dr. R. CAMERON (Cardiff) said that early diagnosis was sometimes tragically simple, and in other cases exceedingly difficult. He pointed out that in Cardiff, during 1926, 527 fresh cases of tuberculosis had been notified and that the number of deaths from the disease was 288. These figures were relatively small, as during the year no serious influenza epidemic had occurred. After giving other interesting details as to the prevalence of the disease, and the housing conditions, together with the number of contacts, he proceeded to the detailed account of the early diagnosis of pulmonary tuberculosis, basing his description on Pottenger's classification of the symptoms into pulmonary, reflex, and catarrhal. He next emphasised the diversity of the modes of onset of pulmonary tuberculosis, and finally discussed the various methods of physical, laboratory, and radiographic examination. The tuberculin tests were not, he considered, of practical value to general practitioners.

Dr. J. R. GILLESPIE (Belfast) thought that the subcutaneous tuberculin test, but not Pirquet's skin reaction, was of great value in diagnosis. During the past 15 years he had found 300 cases giving negative results to the test, and of these only five subsequently developed tuberculosis. It should be remembered that a negative tuberculin test did not mean that the patient would be immune for life.

Dr. AMBROSE OWEN (Aberdare) agreed with Dr. Kennedy that tuberculosis was on the decline, but he thought that public health measures had done much to decrease the incidence of non-pulmonary tuberculosis. Epidemics of other diseases such as influenza were largely instrumental in increasing the incidence of pulmonary tuberculosis. Contrary to Dr. Kennedy's opinion, he found phthisis more acute than it was 15 years ago. Pleurisy and hæmoptysis were not always indicative of tuberculosis. Hæmoptysis especially was a frequent complication in epidemic influenza. A striking fact was that hæmoptysis occurred in phthisical and non-phthisical patients during the same seasons, and in the former was often due to secondary infections. Our failure to control the great epidemics affecting the respiratory system was one of the reasons why phthisis was still so rampant.

Dr. R. J. MATTHEWS (Newport) pointed out the contrast beyween tuberculin reactions in the urban and rural populations. The former gave positive and the latter negative reactions in most of the cases he had tested.

Dr. KENNEDY, in reply, said that we could only judge the results of treatment by statistics. Epidemics ceased owing to the attenuation of the germ and to the elimination of the susceptible people by death. By keeping alive those susceptible to tuberculosis, we were doing our own progeny a grave injustice.

EXHIBITION OF DRUGS, SURGICAL INSTRUMENTS, FOODS, AND APPLIANCES.

(*Concluded from p. 302.*)

SURGICAL AIDS; HOSPITAL AND LABORATORY EQUIPMENT.

[21] The Denver Chemical Manufacturing Co. and [25] The Thermogene Co., Ltd. (Haywards Heath, Sussex, and Victoria Embankment, E.C. 4), displayed their well-known "Antiphlogistine" and medicated wadding respectively for the few who are not already convinced of their value.—[53] Baird and Tatlock, London, Ltd. (14–15, Cross-street, Hatton-garden, E.C. 1), from a large selection of bacteriological, pathological, and physiological apparatus, selected for special attention an incubator with a patent registered regulator; Kahn's outfit for the precipitation test of leprosy and syphilis; and Horrock's outfit for detecting chemical poisons in water.—[79] British Distribution Co. (52, Mortimer-street, W. 1) demonstrated the "Camp" physiological supports, embodying certain patent adjustments designed to give correct anatomical support without undue constriction and with the required pressure and uplift. Special models shown were the "Camp" ptosis support for gastric or intestinal prolapse; "Camp" visceroptosis support, giving a flattening yet upward-cupping effect, and "Camp" post-operative supports.—[29] R. H. Dent (309, Oxford-street, W. 1) had devised several new features of the "Ardente Aid for the Deaf." The wrist-watch pattern, shown last year, has been followed by the "hat-button," which can be pinned inside the lining of a hat and is remarkably inconspicuous. The latest stethoscope is smaller than its predecessors, can be used monaurally or binaurally, and gives a very clear enhanced sound with complete absence of electrical noises.—[35] Fassett and Johnson, Ltd. (86, Clerkenwell-road, E.C. 1), were showing again the well-known Mead's rubber adhesive plaster, and Seabury's "Gold Cross" absorbent cotton, as well as plasters, ligatures, and bandages.—[85] General Acoustics, Ltd. (77, Wigmore-street, W. 1), drew special attention this year to the new "Dime" earpiece, about the size of a sixpence and weighing two ounces, worn without head-band or crook, and leaving the hands free. The midget battery is very powerful and gives no distortion.—[15] Theodore Hamblin, Ltd. (15, Wigmore-street, W.1), showed ophthalmic instruments and equipment, including the Lister-Morton luminous ophthalmoscope; a new children's astigmatic test by Mr. E. E. Maddox; the Lawson self-contained operating lamp for use where no electric current is available; and a special display of telescopic spectacles for operating and for low visual acuity.—[13] Charles Hearson and Co., Ltd. (68, Willow-walk, S.E. 1), showed a wide range of incubators, ovens, stills, centrifuges, and other laboratory equipment, including the "Hellige" comparator for estimating pH values; a new "Klett" top-reader colorimeter, and several new Reichert microscopes, especially a monobinocular one on a new principle. This firm has opened a new show-room at 27, Mortimer-street, W. 1.—[40] Hoskins and Sewell, Ltd. (Bordersley, Birmingham), emphasised the usefulness of the new patent castor-pad action for allowing the bedstead to stand firm on rubber pads or to be wheeled on castors. They also showed the Nottingham Children's Hospital wheeling cot; the S. P. Smith's extension fittings with side attachment for abductions, by which any and all fractured limbs can be fixed; and several other bed attachments and screens.—At Stand [56], The Inhaling Drug and Apparatus Co., Ltd. (30, Grosvenor-place, S.W. 1), we learned that even insulin may now be administered by inhalation therapy, while excellent reports have been received of the use of the Spiess-Drager drug nebulising and inhaling apparatus in the treatment of tuberculosis and whooping-cough, as well as asthma and other lung conditions.—[64] Short and Mason, Ltd. (Atlantic House, 45–50, Holborn-viaduct, E.C. 1), demonstrated

the familiar "Tycos" sphygmomanometers, thermometers, and barometers. The new automatic recording type will be on the market shortly.—[92] Simco, Ltd. (22–28, Shand-street, S.E. 1), showed a range of beds which contain no cast iron, and are, therefore, unbreakable, especially an adjustable fabric-bottomed bed in which the patient can be put into any position with a minimum of effort. The universal bottom can be fitted on any ordinary bed frame, and is, therefore, extremely convenient for home nursing.—[4] Spencer Corsets, Ltd. (Banbury, Oxon), stressed the fact that each garment made by them is designed for each individual patient from exact measurements by a trained corsetière. They drew particular attention to their sacro-iliac corset and abdominal supporting corset for visceroptosis and pregnancy.—[48] John Weiss and Son, Ltd. (287, Oxford-street, W. 1), had a display of surgical instruments, including many new models and modifications, and a great number in stainless steel. The display included thyroid and cystoscopic instruments, and Bishop Harman's scotograph.—[90] Whitfield's Bedsteads, Ltd. (109–125, Watery-lane, Bordersley, Birmingham), showed improved "Lawson Tait" fracture, epileptic, cardiac, and obstetric bedsteads, drawing attention to the fact that the double wheeling foot-end can be let down on to wood blocks when the bed is wanted steady. The obstetric pattern has nickel-plated crutches and a winding-up frame.

X Ray, Light, and Heat Apparatus.

[78] The Dowsing Radiant Heat Co., Ltd. (91–93, Baker-street, W. 1), showed samples of many modern appliances for the application of the Dowsing treatment, ultra-violet lamps, and electric radiators of all kinds, particularly an expanding radiant heat apparatus which can be used for both legs or the abdomen or a single limb.—[91] Philips Lamps, Ltd. (145, Charing Cross-road, W.C. 2), introduced the "Metalix-Portable," a new compact apparatus for the general practitioner, which packs into a suit-case, stands on adjustable telescopic legs, plugs into any wall fixture, and is absolutely shock-proof. There was also a new deep therapy tube for operation at 220,000 volts.—[77] The Solus Electrical Co. (100, Judd-street, W.C. 1) showed a 30-M.A. X ray transformer set, complete with all-metal control table; the Solus-Jarhns Potter-Bucky motor-driven revolving grid, with special centring device; the valve-rectified "Solustat" apparatus; an air-cooled double-gap diathermy apparatus, and a great range of electro-medical and ultra-violet apparatus.

Books.

[5] Messrs. Baillière, Tindall and Cox (8, Henrietta-street, W.C. 2) exhibited English and American medical and scientific books from their own press, as well as those issued by a number of other firms.—[68] Messrs. J. and A. Churchill (40, Gloucester-place, W. 1) showed an interesting series of medical directories, from the small crown octavo of an inch thick, of 1846, up to the enormous eighty-fourth issue of last year. Among other books were Massie's "Surgical Anatomy"; the seventh edition of Rowlands and Turner's "Operations of Surgery"; the new Taylor's "Medical Jurisprudence"; the ninth edition of Cushny's "Pharmacology"; and the "Recent Advances" series, of which the latest are: "Diseases of Children," by W. J. Pearson and W. G. Wyllie; "Surgery," by W. Heneage Ogilvie; and "Tropical Medicine," by Sir Leonard Rogers—[72] William Heinemann, Ltd. (99, Great Russell-street, W.C. 1), included in their exhibit MacCormac's new edition of Jacobi's "Atlas of Dermochromes"; the second edition of Dan McKenzie's "Diseases of the Throat, Nose and Ear"; McDonagh's "Nature of Disease"; and Halls-Dally's "Low Blood Pressure."—[37] H. K. Lewis and Co., Ltd. (136 and 140, Gower-street, W. 1), had a number of convenient clerical aids for the practitioner, including a new roll-top cabinet for panel envelopes in one, two, three, or four sections, each holding 500; and a useful series of instruction slips for patients, giving printed details, for instance, of how to prepare a fomentation, exercises for constipation, after-care of dental extractions, and alkaline treatment of gastric ulcer. On the covers supplied for these slips are relevant reminders for the doctor. Among the books recently issued by this firm are "The Injection Treatment of Varicose Veins," by A. H. Douthwaite, third edition; "A Shorter Anatomy" and "Anatomy for Artists," by E. Wolff; and "The Brain from Ape to Man," by Dr. Tilney.—[89] The Oxford University Press (Falcon-square, E.C. 1) showed text-books, manuals, and other works, including "Gastro-Intestinal Diseases," from the James Mackenzie Institute; the Robert Jones birthday volume; the fourth edition of Humphris' "Artificial Sunlight"; and the second enlarged edition of Fairbairn's "Gynæcology with Obstetrics."—[16] John Wright and Sons, Ltd. (Bristol), showed a large selection of books, including a new edition of Herbert French's "Index of Differential Diagnosis of Main Symptoms"; H. L. Tidy's "Index of Symptomatology"; C. P. Wakeley's and St. J. D. Buxton's "Surgical Pathology"; and the "Synopsis" series.

Spas.

[94] Braceborough Spa (Lincs.) is already known as valuable for skin affections, and its water is now being prescribed for the treatment of latent infections. The calcium content is very high: 30·39 grs. per gallon of calcium bicarbonate, and is, therefore, recommended for all forms of calcium deficiency, particularly in infants.—[18] Harrogate (Baths and Wells Department) has added to its already diverse waters "Fango," a curative mud which has recently been discovered near the axis of the anticline around which the peculiar geological formation of the Harrogate strata centres. The mud is radioactive, and contains sulphur.—[3] The Stanboroughs is the London hydropathic establishment, and has excellent facilities for convalescent care and modern methods of treatment.

Miscellaneous.

[74] The Food Education Society (29, Gordon-square, W.C. 1) displayed its dietetic books and pamphlets, including a number of Welsh editions. The latest leaflet, entitled "A Salad a Day," gives arguments and prescriptions for salads. Mr. Hecht's "School and University Diet" and "The Diet of Brain Workers" were selling well, and another useful publication on show was "The Reform of Institutional Housekeeping."—[86] The Hammond Varityper Co., Ltd. (75, Queen Victoria-street, E.C. 4), naturally laid emphasis on the special medical keyboards for typing prescriptions, and also the mathematical and chemical formulæ keyboards and those especially adapted for writing in foreign languages.—[36] The Medical Insurance Agency (B.M.A. House, W.C. 1) again recommended its valuable services, particularly drawing attention to the charitable work it is able to support both at Epsom College and for the orphan daughters of medical men. Messrs. Mann, Egerton and Co., Ltd., continue to act as consulting motor engineers to the agency.—[55] The Medical Sickness Annuity and Life Assurance Society, Ltd. (300, High Holborn, W.C. 1), offered its usual attractive policies to doctors and dentists.—[88] An unusual but very interesting exhibit was that of the Pentecon High-pressure Casserole Cooker, shown by Phillips and Proctor, Ltd. (125, High Holborn, W.C.1). In this simple covered saucepan food is cooked under a pressure of 45 pounds to the square inch. In this way the heat is greatly intensified, and any food can be cooked in eight minutes. It is almost impossible to overcook, and therefore a joint and vegetables can be put in together, the pressure adjusted by a simple device on the cover, and when the whistle blows a few minutes later all the contents will be found equally cooked. In addition to the obvious domestic advantage in saving time, worry, and fuel, there is a dietetic advantage in that the starch-cells are merely swollen and not burst by this cooking and the "goodness" is therefore conserved. The taste is certainly

excellent.—[66] Radiation, Ltd. (15, Grosvenor-place, S.W. 1), showed an exhibit of gas-heated appliances for dentists, and described by means of diagrams a series of experiments undertaken in an attempt to improve the quality of the heat emitted by gas-grates and cookers by obtaining a softer and more penetrating wave-length.—[75] The "Vita" Glass Marketing Board (Aldwych House, W.C. 2) attended for the first time to explain the properties and methods of fitting "Vita" glass which, while transmitting a large proportion of the ultra-violet spectrum, is indistinguishable from it in appearance, can be obtained from local builders, and is entirely British.

Special Articles.

CONGRESS OF RADIOLOGY.

STOCKHOLM: JULY 23RD–27TH, 1928.

THE Second International Congress of Radiology which met in Stockholm from July 23rd to 27th, under the presidency of Prof. GOSTA FORSSELL (Stockholm), was attended by 962 members from 40 countries. T.R.H. the Crown Prince and Prince Charles of Sweden were present at the inaugural meeting in the Concert House, when Prof. Forssell received the presidential badge, a gift from the British Institute of Radiology, at the hands of Mr. C. Thurstan Holland and Dr. Stanley Melville, respectively president and secretary-general of the First International Congress held in London in 1925. The President then opened a discussion on Teaching and Training in Medical Radiology, expressing his own conviction that radiology has become so important to medical science as a whole, and so firmly established as a department of that science, as to make a systematic presentation of the subject an essential part of the general medical education. He was followed by Dr. J. BELOT, speaking for France, Prof. M. HICKEY, for U.S.A., Dr. G. HOLZKNECHT, for Austria, Dr. MELVILLE, for Great Britain, and others, all whose papers will be published in book form as a supplement to *Acta Radiologica*. The sectional proceedings of the Congress took place in the Riksdagshuset, being divided into (1) Rontgen Diagnostics, (2) Rontgen and Radium Therapy, (3) Radiobiology and Heliotherapy, and (4) Radiophysics and Medical Radiology. Altogether 225 papers were read, one of which we published in our issue of August 4th (p. 221); abstracts of several others follow. In the first section a number of papers dealt with opaque injections into brain and spinal column for the diagnosis of tumours and other diseased conditions of the central nervous system (encephalography and myelography), into female genital organs (hysterosalpingography), into kidneys (pyelography and pneumopyelography), as well as the use of contrast means in the examination of the accessory sinuses of the nose. In the second section the chief interest centred around the radium treatment of malignant tumours and the X ray treatment of nervous disease of different kinds—tuberculosis, goitre, and diseases of the skin. The organisation and the results obtained at Radiumhemmet in Stockholm were illustrated by a demonstration of some 100 patients. In the third section papers were read on the effect of light in various diseases, the action of ultra-violet rays on cells and tissues, and the therapeutic value of irradiated oils. The fourth section had two main themes on its programme: (1) the establishment of an international unit of dosage in X ray treatment, to which a leading article was devoted in our columns last week; and (2) the question how to obtain international regulations for protection in radiological work. The latter led to the setting up of an international committee to carry out with a few small alterations the recommendations of the British X ray and Radium Protection Committee. During the Congress the International Committee of Radiology met and appointed an executive committee consisting of Prof. Forssell, Mr. Thurstan Holland, Dr. A. Béclère, Prof. W. Friedrich, Prof. M. Haudek, Dr. G. A. Pfahler, and Prof. P. Tandoja, which fixed Paris as the place for the Third International Congress in 1931, with Dr. Béclère as its president. An exhibition in connexion with the Congress comprised apparatus shown by 45 firms, of which 24 were from Germany, 7 from England, and 5 from Sweden.

Rationale of Radiation Therapy.

Invited to contribute a paper on this subject Dr. ROBERT KNOX (London) dealt with the radiation treatment of certain diseases, arranged for convenience of reference in groups. In the cases treated, at one period or another, a degree of control was obtained by systematic dosage; to ascertain the nature of this control innumerable observations were made in regard to dosage, absorption of the radiations, and the nature of the response of the tissues to these radiations. Two main fields of investigation were open: (1) the physical dose, and (2) the tissue response. It was decided to concentrate on one tissue and, because of the advantages offered by the blood, it was arranged, as a preliminary investigation, to explore the changes induced in blood and bone marrow by X rays of known wave-length. Mr. W. V. Mayneord made the precise physical measurements of the radiation. The tissue response was measured by Dr. A. Piney, who observed the hæmatological and histological changes in a number of animals subjected to measured doses of X rays. The direction of the experimental work was suggested by the clinical observations made in a case of myelogenous leukæmia where apparently a progressive action on the blood was induced by measured doses of radiations, and where after cessation of treatment, changes, quantitative and qualitative, continued for several months until a minimum count was reached. The animal experiments establish that radiations initiate a change which is progressive, and which continues after the cessation of treatment, and independently of subsequent procedures. The conclusions are to some extent analogous to those made by Dr. A. Leitch on the production of cancer in animals by repeated applications of tar products; when the tar had been applied frequently and for a certain length of time and the irritant was then removed, carcinomata made their appearance at a later date. Dr. Piney found the effects of divided doses to be more intense and more prolonged than those of a single dose, whilst also having a rather different qualitative result—namely, the former cause no alteration in the monocyte count.

Massive Collapse of the Lung.

Dr. L. R. SANTE (St. Louis, Mo.) and Dr. D. R. BOWEN (Philadelphia) both read papers on this peculiar condition in which one or more lobes of the lung, without apparent cause, suddenly lose their air content and become atelectatic. First described by W. Pasteur in 1890, the condition is scantily mentioned in the literature until recent years. With the loss of air content the lung becomes smaller, drawing the chest wall down with it, the mediastinal structures inward and the diaphragm upward as it collapses. The resulting atelectatic lung produces as dense a consolidation as pneumonia. These rontgenographic findings are characteristic. Dr. Sante has observed under direct fluoroscopic vision that such a fully collapsed lung can be caused to reinflate in many instances, merely by rolling the patient back and forth on his unaffected side and causing him to cough, and he suggests this as a method of treatment. Dr. Bowen emphasised the recent rediscovery of atelectasis as a post-operative complication with precisely similar conditions to those recurring with foreign body or infectious disease.

Radium Treatment of Intrinsic Carcinoma of the Larynx.

Dr. N. S. FINZI and Mr. DOUGLAS HARMER (London) described their method as closely resembling that employed at Bayet's Clinic. The incision starts at the centre of the hyoid bone and extends outwards and downwards along the posterior border of the thyroid cartilage. The thyroid cartilage is exposed, the perichondrium stripped from it and the greater portion of the cartilage then resected, making a large window. A number of radium needles are then inserted under the cartilage, great care being taken not to penetrate into the growth or into the larynx. The needles are parallel and are placed vertically, each one touching the next. The greatest care is taken to prevent sepsis. The threads attached to the needles are buried beneath the muscles and the wound is completely closed until the needles are removed from 4½ to 8 days later. If the anterior commissure is involved the other side of the larynx is treated in the same way. About 7 mg. of radium element is used if one side only is treated and about 12 mg. if both sides are treated. The filter is 0·5 mm. of platinum and the time from 4½ to 8 days. In some cases a small dose of heavily filtered X rays has been given two or three days before the operation. The closed wound having been sealed by a collodion dressing, a low tracheotomy is performed to avoid trouble from swelling of the glottis, which may result from the radium treatment; this tracheotomy is usually kept open for about six weeks. Fifteen cases have been treated with the following result:—

(1) In eight of these the growth was confined to one vocal cord and did not involve either the anterior commissure or the arytenoid cartilage. In six the growths entirely disappeared and the patients have remained well for periods of from one to three years. Gramophone records will be used to show the superiority of the results as regards function over those obtained by laryngo-fissure. In most of them the vocal cords have recovered to such an extent that it is impossible to detect on which side the growths were situated. In one case the growth diminished in size, but a stenosis of the glottis resulted and the patient died suddenly eight months later of unknown cause. In the eighth case no real improvement resulted from the treatment.

(2) Five cases were advanced, the disease having crossed the middle line in front and involved the other vocal cord, so that nothing except some form of laryngectomy was available as a surgical procedure. One has remained well for four years; his vocal cords are freely movable and appear normal, but the voice result is not as good as would be expected (gramophone record). In one case the disease in the larynx entirely disappeared, but the patient died later from a recurrence, which occurred in the tracheotomy wound a year after the treatment. Of the other three cases, one died during the operation, in one no improvement was noticed, and in one there was improvement, but later recurrence.

(3) Two inoperable cases in which the disease had extended into the larynx or through the laryngeal cartilages into the neck with enlargement of the cervical glands. In one the growth disappeared and the glands were removed by operation; the larynx remained healthy for two and a half years, but there is now a thickening of the vocal cord, probably due to a recurrence. In the other there was very great improvement, but the patient died after 15 months, probably from mediastinal metastases.

It is claimed that in operable cases the after-results as regards function are superior to surgical operation, and, if they prove to be permanent, will probably replace it. In advanced cases there seems no doubt, they say, that radium should always be tried before laryngectomy.

X Ray Therapy of Exophthalmic Goitre.

Dr. G. FORSSELL and Dr. O. SANDSTRÖM (Stockholm) gave a survey of experiences at Radiumhemmet of the X ray treatment during the period 1918–25 of 80 cases of typical morbus basedowii. In 57 cases the treatment was completed and the results controlled by re-examination of the patients. Of these 57 cases 30 (52·6 per cent.) are now quite well and able to work; 13 (22·8 per cent.) are much improved and able to work, but still have certain symptoms; 75·4 per cent., therefore, have been rendered able to work; 5 cases (8·8 per cent.) are improved, but not quite able to work, and as many (5) are unimproved or worse; there are 3 (5·3 per cent.) recurrences after recovery or considerable improvement having lasted for some time; there has been one death. Approximately one-fourth of the number of cases have been of severe nature, the rest of medium severity. The risk of rontgen treatment in expert hands is slight. Yet there is a certain risk of producing hypothyroidism, particularly in case of the nutrition of the thyroid being reduced by some operative interference preceding or following the X ray treatment.

Dr. A. SOILAND, Dr. W. E. COSTOLOW, and Dr. O. N. MELAND (Los Angeles) gave a critical survey of radiation therapy in exophthalmic goitre, as revealed by a questionnaire, and show that of 5400 cases treated 73 per cent. were cured, 16 per cent. improved, and 11 per cent. unimproved. Failures to respond to the treatment are attributed to poor selection of cases on the part of the physician, lack of coöperation on the part of the patient, and lack of radio-sensitivity of the goitre. Whether or not this last cause is correct cannot be definitely decided at present, as improvement in technique may eliminate it. This analysis gives figures which are comparable to those obtained in surgery, with the added advantage of no mortality due to the treatment itself.

X Ray Treatment of Multiple Sclerosis.

Stimulated by the published successes of Marinesco (1910) and Duhain (1911), Dr. A. Romanowa-Leskowa and Dr. K. W. Ipatow (Leningrad) began the treatment of *sclérose en plaques* by X rays in 1922, and reported good results in two cases at the Psycho-Neurological Society of Leningrad in 1924, and in a total of 30 cases at the Physiotherapeutic Society of Leningrad in 1927. Their cases now number 40, of which only 28 have been observed for more than a year; the remaining 12 were lost sight of after some improvement had been achieved. Treatment is administered in seven sittings; at intervals of 1–2 days the skull is irradiated three times, the neck once, the chest twice, and the sacrum once. This series is given ten times in the year, the whole course being repeated after an interval of 6 to 12 months. Of the 28 patients, 22 showed more or less definite improvement up to clinical cure, including improvement of gait and speech, disappearance of tremor, return of abdominal reflexes, and so forth. No case was completely unsuccessful, but six were only slightly bettered. Improvement may only be apparent after several months or even years. The authors employed hard rays filtered through 4 mm. of aluminium, and a dose not exceeding 25 per cent. HED measured on the skin.

New Method of Treating Asthma by Radiation.

While working on a special technique for treating cancer by radiation at the London Hospital, Dr. S. G. SCOTT noticed that the method had a beneficial effect on asthmatical patients. A number of cases of asthma of all types have now been treated; in really bad cases the results are often spectacular. When bronchitis is predominant, while the attacks of asthma may be relieved, the bronchitis itself is but little affected. Certain observations suggest some metabolic influence on the ductless glands—e.g., (1) beneficial results can be obtained by radiation of the abdomen only; (2) increase in body weight is in many cases remarkable; (3) there is a general feeling of well-being experienced by most patients. The method requires a large radiation field and small dosage. The field includes the whole trunk, the abdomen being the important area. The tubes are centred over the epigastrium and over a corresponding point posteriorly. The voltage should not be above 170,000, a filter of 3 mm. aluminium being used. Treatment is given twice weekly in bad cases and once weekly in average cases, four to six being the course. No blood changes occur and only slight nausea in a few patients. Dr. Scott reported on 130 cases so treated, and suggested

that the same technique might prove of value is whooping-cough.

Treatment by Irradiated Oils.

At the instigation of Prof. S. A. Brustein, Dr. Th. Rothstein (Leningrad) began three years ago to employ external treatment of painful affections by means of compresses of irradiated oil. The technique consists in exposing the fresh oil, whether obtained from the sunflower, peach, nut, or cod liver, to 500, 1000, or 1500 ultra-violet units measured on the Salkindson photo-quantimeter. The 176 cases treated included polyarthritis 71, neuralgia 92, the most conspicuous result being in every case a reduction of painfulness and a parallel diminution of local heat. The compresses seem to the author to have their use in every case where direct ultra-violet treatment is used, with the added advantage of portability. The activity of the irradiated oils lasts at least 15 months, during which time the oils retain definite physical and chemical changes in viscosity, absorption spectrum, and iodine number.

MEDICINE AND THE LAW.

Chemist's Duty under Dangerous Drugs Legislation: Conviction Quashed.

UNDER the Dangerous Drugs Act and Regulations a chemist must not dispense a prescription containing certain drugs unless (*a*) he is acquainted with the prescriber's signature and has no reason to doubt the genuineness of the prescription, or (*b*) he has taken reasonably sufficient steps to satisfy himself that the prescription is genuine. If he dispenses prescriptions otherwise than in accordance with the Regulations, he commits an offence against the Act. For an offence of this nature Henry Clarence Thompson, a chemist, of West Derby-road, Liverpool, was convicted last June by the Liverpool Stipendiary Magistrate, and was fined £40 with £5 5*s*. costs. The charge was that of unlawfully dispensing a prescription for grs. 20 morphia sulphate to William Arthur Young without having taken reasonably sufficient steps to satisfy himself that the prescription was genuine. Against this conviction Mr. Thompson has now successfully appealed. It appeared from statements made during the proceedings that Young had posed as a doctor in Liverpool without possessing the requisite qualifications, that he had attended patients and had even certified a mental case. Young was convicted of wilfully and falsely pretending to be a doctor and also of obtaining certain quantities of morphia sulphate from two chemists; he was sentenced to imprisonment, which he is at present serving. It was stated that he had practised as a doctor in Canada but had got into trouble, and lost his qualifications and had been deported. The prosecution of Mr. Thompson was obviously a sequel to the prosecution of Young. The most important evidence called on Mr. Thompson's behalf was that of Dr. W. R. L. Waters, of Tue Brook, who had met Young. Young told Dr. Waters that he was a Canadian mental specialist who wished to set up practice in Liverpool. "I did not look him up in the Register," said Dr. Waters; "he was a convincing person and had a good knowledge of mental cases; he impressed me as a man of ability, and I was satisfied that he was a medical man; I allowed him to see one of my patients with me, and he wrote out a detailed history of the case—a mental one." In answer to the Recorder (Mr. Hemmerde, K.C.), Dr. Waters agreed that the more a chemist had examined Young, the more he would have been satisfied that Young was a doctor; he also said that he would not have hesitated to let Young look after his patients at a week-end if he had been going away. The Recorder said that if there was nothing to make Dr. Waters suspicious, there was nothing to make Mr. Thompson suspicious. The latter's appeal was allowed with costs.

One medical practitioner meeting another occasionally in the course of professional routine does not hold him at arm's length till he has obtained authentic evidence of his identity, qualifications, and registration. Similarly a chemist, who gradually becomes acquainted with the signatures of doctors who practise in his neighbourhood, can hardly be expected to go through a similar process when presented with a prescription over a signature with which he is unfamiliar. Is it to be deemed compulsory for a chemist to keep on his premises a copy of the latest medical list? If he does so, he may still be deceived by a forged signature, or conceivably the owner of the signature may have been deprived of his qualifications since the list was published. Nevertheless, the law requires that such reasonably sufficient steps be taken by the chemist as will satisfy him of the genuineness of the prescription; he must certainly not refrain from following up any point which arouses his suspicion. With regard to Dr. Waters's answers to the Recorder, it is doubtless unnecessary to repeat the warnings which appear in "The Conduct of Medical Practice." A practitioner who enters into partnership, or who engages the services of an assistant, must in every case verify the fact of registration. Dr. Waters would no doubt have taken this step before entrusting any of his patients, for however short a time, to Young.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Medical Research.

Sir Robert Philip's report, as curator of the laboratory of the Royal College of Physicians of Edinburgh, shows that the 24 investigators there have been doing good work on many different subjects. The use of taurine in tuberculosis has been further studied, and its influence on the disease has been found to be comparatively slight. The curator, with Prof. T. J. Mackie, has been doing research bearing on the standardisation of tuberculin; the superintendent (Lieut.-Colonel A. G. McKendrick) and Dr. W. O. Kermack have been carrying on their work on the mathematical theory of contagious epidemics, and Colonel McKendrick has also published a statistical examination of antirabic treatment in India. He has further collaborated with Dr. Kermack and Dr. Eric Ponder in their research on the sedimentation of red blood cells, whilst Dr. Kermack has, with various collaborators, investigated the chemistry of harmine and other alkaloids, the rôle of dihydroxyacetone in carbohydrate metabolism, and the physical properties of Wassermann antigens. Mr. C. I. B. Voge has continued his studies of the reactions of syphilitic and normal sera; Dr. C. G. Lambie and Dr. F. A. Redhead have made some interesting observations on the influence of pituitrin on the metabolism of glucose and dihydroxyacetone; Dr. David Orr has investigated the changes to be found in the nervous system of animals receiving intravenous injections of bacterial emulsions, and Dr. Donald Stewart has carried to a further stage his work on the chemistry and cytology of the cerebro-spinal fluid in children. Lieut.-Colonel W. F. Harvey, a newcomer to the laboratory, is examining Gram's method of staining unicellular organisms, and has found efficient substitutes for the alcohol, aniline oil or phenol constituents of the dye. He is also studying the parenteral introduction of foreign nerve material into rats. Other subjects being dealt with are the conditions which favour heat-stroke, the infection of children by pulmonary diseases, the pathology of deaf mutism, the histopathology of the skin, the types of tubercle bacilli found in surgical lesions, and the icterus index of serum in cases of jaundice.

Status of the Sanitary Inspector.

At the annual conference of the Sanitary Inspectors Association, held at Dunfermline, Dr. Frederick Dittmar, Chief Medical Officer of the Scottish Board

of Health, pointed out that the days were gone when it was believed that a policeman or a plumber should occupy the position of sanitary inspector. Generally speaking, the sanitary inspector nowadays had to know something about buildings, building construction, meat inspection, and dairy work, so that he must be a man of fairly wide training. He should have a first-class school training, and ideally should occupy some position similar to that of the articled pupil in the engineering trade, who first had his theoretical training, and then had to go through the shops. Something in that line would have to be marked out for the sanitary inspector of the future, and Dr. Dittmar thought it by no means impracticable. The status of the sanitary inspector might then take care of itself.

Factory Work and Welfare.

The report of the Chief Inspector of Factories and Workshops shows that there were over 18,000 accidents in Scotland last year, of which 145 were fatal. The deaths of two men who had for many years been employed in the manufacture of sheep dip present puzzling features.

The first man, who had been engaged in the manufacture of dip for over 30 years, died from chronic arsenical poisoning, bronchitis, and emphysema. The senior medical inspector (Dr. J. C. Bridge) remarks that in this case no lesion of the skin—a characteristic effect of arsenical poisoning—was observed, and as no autopsy was held, the association of arsenic with the cause of death remained obscure.

Inquiry was made into a somewhat similar case affecting a man, aged 51, who had been employed for 29 years also in a sheep dip works, although since 1923 he had been removed from contact with arsenic. Dr. Bridge states that "on three separate occasions growths had been removed from the skin, and in this case the post-mortem examination revealed the presence of chronic bronchitis, which might have been due to the exposure to arsenic dust, but this was not clearly established. A full investigation of cases such as these is of undoubted value."

A firm engaged in the manufacture of sheep dip has installed baths, and has made the taking of them a condition of employment of all those in contact with arsenical compound. Although there was, it is stated, a little difficulty at the outset, this was easily overcome, and subsequently these baths were made available for other employees, male and female.

Continued progress in improvement of welfare conditions is reported. A large printing and publishing firm in Lanarkshire has taken advantage of the decision to construct an up-to-date factory on model lines to launch an ambitious and comprehensive scheme of welfare work. Embodied in the design of the factory itself is every modern improvement that makes for efficiency and general welfare. The site has been chosen in the country, but by reason of excellent and cheap travelling facilities, the city centre is not far distant. The kitchen is entirely electrical, and meals are to be provided for the workers at prices scarcely above cost, whilst, for those who prefer to bring their own food, specially designed warming cabinets are provided. The lavatories are described by the works manager as probably superior to those in the best hotels of the country, and a separate self-locking lavatory has been allotted to each group of 20 workers, every worker being provided with a key.

V.A.D. Road Services.

At the Voluntary Aid Detachment gathering at Aboyne, the proposal was discussed to utilise the services of V.A.D. nurses for first-aid and other work in connexion with road accidents. Dr. J. C. M. Matheson, of Laurencekirk, said that headquarters had expressed their approval of the scheme, and he was hopeful of seeing all arrangements in Kincardineshire completed shortly. War was a very remote possibility, and a vigorous effort should be made to deflect the training and experience of many capable nurses into the service indicated.

The movement is also receiving support in Aberdeen, and is expected to spread to other counties in Scotland.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Censorship of Publications.

IMMEDIATELY before the adjournment of the Dail the first reading was taken of the Censorship of Publications Bill, 1928, a measure designed to prohibit the sale and distribution of unwholesome literature. The text of the Bill has, however, been issued only within the past few days. Apart from its purely moral and social aspects the Bill has special interest for the medical profession. It is proposed to set up a board of five censors, on the report of four of whom the Minister of Justice may issue an order prohibiting the sale or distribution of a book regarded by them as indecent or obscene, or tending to inculcate principles contrary to public morality, or of such character that it tends to be injurious or detrimental to or subversive of public morality. Similar action may be taken in regard to a periodical, recent issues of which may be adjudged to have offended. Disobedience to an order may be punished by fine or imprisonment, or both, and, in any case, forfeiture of the book or periodical. Special sections limit the publication of certain matters in relation to divorce proceedings or other proceedings dealing with the marital relation, and legal proceedings in general. The Bill, however, goes much further than this. It prohibits, otherwise than in accordance with a permit granted by the Minister, the publication, selling, or keeping for sale, and the distribution of any book or periodical which advocates or might reasonably be supposed to advocate the unnatural prevention of conception or procurement of abortion or miscarriage, or any method, treatment, or appliance to be used for the purpose of such prevention or procurement. Moreover, the printing of advertisements which relate or refer to any disease affecting the generative organs of either sex, or to any complaint or infirmity arising from or relating to sexual intercourse, or to the prevention or removal of irregularities in menstruation, and certain other matters, is brought under the Indecent Advertisements Act of 1889. Another section deals with the exposure of indecent pictures.

Much of the proposed legislation deserves commendation. The prohibition of the advertisement of quack cures for venereal diseases and of "cures for female irregularities" is long overdue. Few will quarrel, except perhaps on academic grounds, with the limitation of the reporting of divorce and similar legal cases—a reform already adopted in England. But the virtual branding of propaganda in favour of birth control as indecent will take many aback. The ethics of birth control are a subject of lively controversy at the moment, and the ethical question can hardly be settled by a legislative enactment. In regard to other matters there is a grave danger that if a board of puritanical or uncultured censors should be appointed, both literature and art would speedily feel themselves cramped.

Royal Institute of Public Health.

The annual congress of the Royal Institute of Public Health was opened in Dublin last Tuesday evening by a reception given by the Minister of Local Government and Public Health, who is President of the Congress. On the following and subsequent days the several sections met for discussion.

A LANCASHIRE REST HOME.—The Directors of British Insulated Cables, Ltd., of Prescot, Lancashire, have bought Upper Downing, Flintshire, for a rest home as part of an after-care scheme for sickness and accident cases among their employees. The cost of maintenance will be defrayed by the Hospital Fund Committee of the employees. Upper Downing, which by now has been opened, was built in 1589, but was remodelled in the Georgian period. It stands close to Downing Hall, long the home of Thomas Pennant, traveller and naturalist.

GENERAL MEDICAL COUNCIL.

EXECUTIVE COMMITTEE.

AT a meeting of the Committee, held on July 23rd, Sir Norman Walker was appointed a member of the Dental Board in the place of the late Sir James Hodsdon.

Restorations to the Register under Section 14.

The following names, erased owing to failure to reply to the Registrar's inquiry, were restored to the Medical Register:—

Thomas Allen, Robert J. Baylor, Chas. Wm. Dixon, John Douglas, John Dwyer, Mervyn Eager, Lennard Game, Harold W. Hodgson, M.C., Elizabeth S. Martin, Vivian Matthew Matthews, Evelyn Arthur Rich.

Direct Representative.

A letter was read from Sir Robert Bolam, resigning his membership of the Council as a Direct Representative on his appointment as Representative of the University of Durham. The vacancy thus caused will be filled by an election to be held before the November Session, at the same time as the election of a Direct Representative to fill the vacancy caused by the death of Dr. Macdonald.

Union of South Africa Medical Act.

A copy of this Act, which also relates to the mandated territory of South-West Africa, was received from the Dominions Office. This Act provides that the Governor-General, after considering any recommendation by the Council, may prescribe by regulation the diplomas, &c., which entitle to registration provided that they entitle the holder to practise in the country in which the body granting it is situated, that there is reciprocity between the Union and the country, and that the standard is not lower than that required in the Union. The Governor-General may make regulations for the registration of medical and dental students. Any unregistered person who practises as a medical practitioner, or performs any act specially pertaining to the calling of a medical practitioner, or pretends to be a medical practitioner, is liable to a fine not exceeding £100. There are similar penalties provided in regard to dentistry. The use of the British Pharmacopœia is enjoined. No registered person may make extortionate charges for services rendered, and if the fee exceeds that usually charged he must, before rendering the service, inform the person concerned of the fee which it is intended to charge. Persons mentally disabled may be suspended from carrying on their profession.

North Australia.

Information was received from the Dominions Office relating to the practice of medicine and surgery in the Territory of North Australia. It appears that the South Australia Acts of 1844, 1880, and 1889 were in force in 1910 when the Northern Territory came under the authority of the Commonwealth, and still hold. The Act of 1844 states that no one shall be deemed a legally qualified medical practitioner unless he shall have proved to the satisfaction of the Medical Board that he held a satisfactory qualification. In the Act of 1880 this was repealed, and it was enacted that no one was to be deemed a medical practitioner unless he possessed one of the qualifications contained in the Schedule. The Schedule, however, was not supplied. In the Act of 1889 the Schedule was repealed, and a new Schedule was appended, which included any qualification entitling to registration in the United Kingdom, a degree of any University in Australasia legally authorised to grant it, and a degree or diploma granted by any body in a British Colony or Possession, or any foreign University which in the opinion of the Medical Board was equal to a qualification entitling to registration in the United Kingdom.

Indian Qualifications.

A communication from the India Office supported a request by the University of Bombay for the extension of the recognition of its M.B., B.S. degree of the University for a further period of three years. The question of appointing a Commissioner of Qualifications and Standards pending the creation of a Medical Council for India has, it was stated, been referred by the Government of India to the local Governments for their consideration. Their replies have not yet been received. It was resolved to recognise for one year the medical degrees of Bombay, Calcutta, Madras, and Punjab Universities, until July 31st, 1929, subject to the receipt (before July 1st, 1929) by the Council of a satisfactory report by an inspector or inspectors appointed by the Government of India and approved by the Council on a Final Examination held in the academic year, 1928–29.

Training of Midwives.

In view of the appointment by the Ministry of Health of a Committee to deal with the functions and training of midwives, it was resolved to ask Sir Donald MacAlister to attend before the Committee on Oct. 24th to explain the general views of the Council, and to introduce Mr. Eason, Sir Leslie Mackenzie, and Mr. Johnston, who should be requested to give evidence relating to the three divisions of the Kingdom.

Definition of Abortion.

At a previous meeting of the Committee, doubt was expressed as to whether the definition of "abortion" in the amended Rules of the Central Midwives Board was sufficiently clear or accurate. The Ministry of Health stated that the definition had been altered to read as follows:—

"The passage of the contents of the uterus before the fœtus is viable—that is, of an age at which it may be reasonably expected to survive. (Note.—For practical purposes a fœtus is not viable before the twenty-eighth week of pregnancy.)"

Obituary.

GEORGE EDWARD WHERRY, M.CHIR. CAMB., F.R.C.S.ENG.

WE regret to announce the death of the well-known Cambridge surgeon, Mr. Wherry, which occurred on August 12th, in the seventy-seventh year of his age. The whole of his professional life was spent in the University city, and the number of Cambridge medical graduates who have regarded him as a friend, both during their undergraduate days and later, must be enormous.

George Edward Wherry was born at Bourne, in Lincolnshire, received his early education at the local grammar school, and, entering the medical school of St. Thomas's Hospital in 1870, obtained his first diploma, M.R.C.S.Eng., at the age of 21. From St. Thomas's Hospital he proceeded to Cambridge as house surgeon at Addenbrooke's Hospital, being admitted at the same time to Downing College as an undergraduate of the University. He held the resident post at Addenbrooke's for four years, and during that time graduated in arts at the University. He took the M.B., B.Ch. degree in 1878, and in the following year he proceeded to that of M.C. In the same year he took the Fellowship of the Royal College of Surgeons of England, and was appointed surgeon to Addenbrooke's Hospital.

In 1883 Sir George Humphry, to whom Wherry owed his original connexion with Addenbrooke's Hospital, resigned the Professorship of Anatomy to take the new and unpaid Professorship of Surgery, and in the same year a University Lectureship in Surgery was established, when Wherry was appointed to the post and held it until its suppression nearly thirty years later. He was never actually Professor

of Surgery. This post was not filled up for seven years after Humphry's death in 1896, when in 1903 Howard Marsh, while still connected with St. Bartholomew's Hospital, was invited to the chair. Four years later Marsh became Master of Downing College, and held the post of Professor until his death, since which it has not been filled up. But if Wherry was never professor in name, no professor could possibly have been more closely associated with the science of surgery as a University subject or more keen for its development than he was. He lectured assiduously, held clinical classes in the wards, acted frequently as an examiner, and supervised during the ten years immediately following the death of Howard Marsh the whole surgical faculty of the University.

Outside his professional work Wherry was well-known to a large circle as an Alpine climber, an antiquarian, and a man of diverse and highly cultivated literary tastes. He married in 1881 Albinia Lucy, daughter of Robert Needham Cust, of the Bengal Civil Service, by whom he had one daughter, who became the wife of Major R. W. Oldfield, Military Attaché to the Legation at Prague.

CHRISTOPHER CHILDS, M.D.Oxf., D.P.H.Camb.

THE death took place on Monday, August 6th, at his residence, Rock House, West Looe, Cornwall, of Dr. Christopher Childs, a well-known pioneer in sanitation and epidemiology. He had reached the age of 81.

Christopher Childs was born at Liskeard, and received his early education at Uppingham School, where he was distinguished alike in work and play, being an exhibitioner, a great runner, and the captain of the football fifteen. From Uppingham he proceeded to Merton College, Oxford, and graduated with a first class in the Natural Science Tripos. Deciding to enter the medical profession, and having won the Radcliffe Trust Special Prize, he completed his clinical course at St. George's Hospital, took the diplomas of the English Colleges, and became house physician to the institution. London practice, however, had no great attraction for him, and for a short time he returned to his old school as science master, when he was able to assist the famous head, Edward Thring, during a dramatic transference of the school from Rutlandshire to Wales, following upon an outbreak of typhoid fever. In 1882 he decided to commence general practice at Weymouth, and for some 12 years he conducted a large practice in that town and neighbourhood, but again he felt that he had not found the career that most appealed to him. At this time the problems of public health and sanitation became more obviously attractive to the medical man with special scientific equipment. In 1895 Childs acquired the diploma of D.P.H. at Cambridge, and left Weymouth for Manchester-square to practise as a sanitary expert. He was accepted quickly as an authority, wrote ably upon epidemiological subjects, and in particular made some comparative studies of typhoid fever epidemics which well represented the knowledge of the time. He lectured on bacteriology and hygiene at University College, London, and examined in those subjects for the English Conjoint Board.

He retired, however, while still in middle age, and removed to Looe, where he passed the last twenty-four years of his life devoting himself to the public welfare of the town, and, indeed, of his native county, being particularly interested in the fortunes of the Cornish fishing industry and the promotion of ambulance work. He was a Knight of Grace of the Order of St. John of Jerusalem.

One who had been his pupil at Uppingham writes: "Childs was a man whom those of his juniors who came into contact with him will always remember as an old friend. Uppingham, during his brief term of office as a science master, was mainly a classical school, and it is doubtful if Childs would have occupied a position of real authority among us had it not been for his personal kindliness and his record on the playing field as athletic champion and captain of football. But the few of us who worked under him in his simply equipped laboratory gained an insight into the beginnings of scientific work which made the later approach to serious study far easier for us."

Dr. Childs married Miss Anne MacRea, of Weymouth, who predeceased him, and by whom he had one son.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. S. G. Rainsford to be Surg. Lt.-Comdr.

The following appts. are notified: Surg. Rear-Admiral H. C. Whiteside is placed on books of *President* while attending conference of Association of Military Surgeons of the United States. Surg. Comdrs: F. C. Wright to *Vindictive*; A. C. Anderson to *Argus*; J. Bourdas to *Victory* for R.N. Barracks, Portsmouth; and H. M. Langdale to *Vernon*. Surg. Lts. E. T. S. Rudd to *Pembroke* for R.M. Infirmary, Chatham; T. Rees to *Hood*; A. S. Nicol to *Impregnable*; D. R. Campbell, L. J. Corbett, and S. J. Savage to *Broke* (on recommg.). Surg. Lt.-Comdr. (D.) B. J. Geekie to *Malabar* for R.N. Hospl., Bermuda.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. W. C. Croly retires on retd. pay.

Maj. C. Clarke, Reg. Army Res. of Off., relinquishes his appt. and resumes the rank of Lt.-Col.

The undermentioned Lts. (on prob.) are confirmed in their rank: F. McL. Richardson, J. W. Eames, and S. R. M. Mackay.

TERRITORIAL ARMY.

Capt. E. White (late R.A.M.C.) to be Lt. and relinquishes the rank of Capt.

W. F. Mulvey to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. A. Greenwood, having attained the age limit, relinquishes his commn. and retains his rank.

ROYAL AIR FORCE.

Flight Lt. H. W. Corner is granted a permanent commission in this rank.

Capt. W. R. Wotton (Army Dental Corps) is granted a temporary commission as a Flight Lt. (Dental) on attachment to the R.A.F.

Flight Lt. (Hon. Sqdn. Ldr.) J. W. H. Steil relinquishes his temporary commission on completion of service and is permitted to retain his rank.

INDIAN MEDICAL SERVICE.

C. L. Noble to be Lt.

Sunderdas Tulsidas Sodah to be Temp. Lt.

ROYAL ARMY MEDICAL COLLEGE.

The following prizes were awarded at the conclusion of the summer course for Lieutenants on probation, R.A.M.C., and I.M.S., at the Royal Army Medical College, Grosvenor-road, London, S.W.: Herbert prize (about £20): Highest aggregate marks, Lt. F. McL. Richardson, R.A.M.C. First Montefiore prize (£20 and bronze medal): Highest marks in military surgery, Lt. A. McMillan, R.A.M.C. Second Montefiore prize (£7): Second highest marks in military surgery, Lt. S. S. Bhatnagar, I.M.S. Parkes Memorial (medal and £5): Highest marks in hygiene, Lt. F. McL. Richardson, R.A.M.C. Ranald Martin (medal and £5): Highest marks in tropical medicine, Lt. F. McL. Richardson, R.A.M.C. Tulloch Memorial (silver medal): Highest marks in pathology by an R.A.M.C. officer, Lt. G. T. L. Archer. Fayrer Memorial (bronze medal): Highest marks in pathology by an I.M.S. officer, Lt. C. J. F. Cropper. De Chaumont prize: Second highest marks in hygiene, Lt. S. R. M. Mackay, R.A.M.C.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Changes in Pensions Administration.

Before the prorogation of Parliament, on Friday, August 3rd, some important questions of policy in the assessment of post-war disability pensions and the medical treatment of pensioners came up.

On the motion for the third reading of the Consolidated Fund (Appropriation) Bill,

Sir Robert Hutchison said, in view of the important statement made by the Minister of Pensions recently, he took that opportunity of raising some important points. There was one point in the statement on which he would like some elucidation—namely, the question of allowances for treatment. They had now got so far away from the war that many of those who were still suffering from wounds, from the affects of gas, and from nervous disability could be considered chronic, and their condition was on quite a different plane from what it was ten years ago. He suggested that there were a great many cases which would be much better cared for in regular institutions where their condition might be ameliorated. They knew of cases where people had been sent for treatment again and again by medical boards, and the nervous exhaustion of the individuals who had to undergo that treatment, and in some cases operations, was pitiful. Some attention ought to be given to this very serious matter. His next point was as to the continuance of re-examination before medical boards for re-assessment of pensions in quite a small number of cases. The argument was used that after a final assessment and the giving of a final pension there were cases that got worse; but statistics would prove that almost 95 per cent. of the cases that had been given final awards did not come up for re-assessment. It seemed to him that the time had arrived when the Ministry should deal generously with the remaining cases, and give them a final pension, even though it might be to the detriment of the State. The amount of money involved must be small compared with the total expenditure. The Government might also consider a definite proposal for closing down the Ministry of Pensions step by step over a period of a few years. Large blocks of people could be given a statutory right to their pensions which would be paid through the Post Office, and the cases which fell for continual attention might be handed over to institutions, or to the care of the medical authorities through the Ministry of Health. In that way money could be saved in a direction in which, at present, there was extravagance considering the work which had to be done. The statement made by the Minister as to the stabilisation of pensions had gladdened the hearts of many, but the more they could close down the Ministry the better it would be for all concerned.

Mr. F. Roberts said that the House agreed that the Government had taken the right and proper course in the stabilisation of war pensions. He would offer resistance to Sir R. Hutchison's proposal with regard to the closing down of the Ministry of Pensions. They recognised that there must be some contraction of the work, but the more they looked around the more they understood how big the question was that confronted them, and how important it was to have a Minister in the House of Commons who could be questioned in regard to the problems affecting ex-Service men. It was essential to maintain this Department, with its voluntary workers and officers throughout the country, in order to keep in operation that human touch which was more necessary in connexion with pensioners than perhaps any other department of our social life. If the Minister of Pensions and the Government were not prepared to accept the view that there should be no time limit, and that if a man was suffering from a war disability, he should thereby be entitled to pension, then he (Mr. Roberts) would ask the right hon. gentleman to what extent he was prepared to go in meeting the needs of those neurasthenic and tuberculous cases which from time to time were such a source of great anxiety. He would also like to ask the Minister whether it was his intention to provide special treatment for border-line cases, in regard to which it was doubtful whether the policy applied was that which Parliament and the country desired.

The Future of the Ministry of Pensions.

Lieut.-Colonel Fremantle said he would like to speak from the point of view of the medical service and medical administration in the Ministry of Pensions. It was sometimes forgotten that the Ministry of Pensions was a most influential part of the health services of the nation, although it was divorced from the general health services. They were all immense admirers of the Minister of Pensions and the work of his staff, but the stoutest defender of the Ministry as a separate entity must admit that it would come to an end one of these days, and it was right that they should envisage the future and try and consider to what extent it was likely to be changed. After they had stabilised the greatest number of pensions this largely became a medical question. From the medical point of view one obviously supposed that before the general body of pensioners had passed into another world rather than have the whole system of treatment of the few that remained die of inanition, the duties of the Department would have to be passed over to some other Department, and the question was how soon that should take place. It was quite true that that was not a question of immediate politics; but it was obvious that sooner or later the responsibility for the institutions and the personnel would have to be transferred. The natural body to complete and wind up the service would seem to be the Ministry of Health, but that would associate itself in their minds with the poor-law guardians, and there had always been a great and natural reluctance to imagine the possibility of in any way fusing this service with the service of the poor-law guardians. The proposal of the Government in the big Bill foreshadowed for next session was, however, to transfer the whole system of the poor-law into the hands of larger authorities—the county councils and the county borough councils—and he thought they would there have a new envisagement of institutional treatment and public health. They would have larger authorities possessing an enlarged service of institutions with a very large field of employment; because, if the new Bill passed substantially in the form in which it was proposed, they would be taking over the whole of the services of that kind, whether they were in the hands of the guardians or those of the district sanitary authorities. He was not going to say straight away that that in itself would qualify them to take over, or operate, the services of the Ministry of Pensions, but it was obvious that it gave them a prima facie reason for believing that they would be the body for that purpose. All that, however, was in the future, and they would, first of all, have to see how this reform worked out. When the counties had produced their schemes and got to work for a year or two, it would be possible to judge whether they would be able to relieve and help the Ministry of Pensions in this work. The Minister would have to consider what was to be the future of his institution and his personnel. The personnel must be a gradually diminishing one, but it would be a very difficult thing to know how to deal with it. There was a whole series of eminent medical men who had given themselves up to the Pensions service, who were chosen for work at the end of the war as the result, perhaps, of their war service, and it would be a difficult thing to turn those men out of the service and give them no future at all. In the same way with institutions; it would be a bad thing to see institutions contracting and becoming less efficient while they had to undertake big schemes for their fusion with all the geographical difficulties that would entail on pensioners and in other directions. Therefore, it was right that the Ministry should envisage the possibility of bit by bit gradually working in and coöperating with the Ministry of Health, and eventually the county and county borough councils, for the gradual fusion of the two services for which, in so far as pensions were concerned, the Ministry of Pensions would naturally retain its responsibility. Only at a later stage would the Minister transfer the institutions to the Ministry of Health.

They had to consider yet another side, and that was the future of the whole of these institutions with their personnel, and this service which had been built up by the present Minister of Pensions and his predecessors. They had developed a new medical science. This subject of the assessment of liability and the attributability of disease to war, with all its difficulties, had been developed by this service, and had become a fine art akin only to the medical service in connexion with insurance. It would be invaluable to the nation as a whole. The institutions with their specialist forms of treatment, as well as their general forms of treatment, had attained a very high professional position, and a high degree of skill and equipment. The great pity was that that should not be made available to the civil population in the future. If the personnel and the institutions were left gradually to slide down and down, though living an independent life, they would lose their standing and value in a large degree before they were transferred to the civil side. The Minister of Pensions should be considering in what way he could coöperate with the Ministry of Health and the other civil authorities in catering for some of the civil needs of the population, and in that way help to keep alive his institutions and maintain them at their highest possible pitch of fitness.

Dr. Drummond Shiels said he was unable to join in th mild congratulations which had been generally given to th

Minister, because he was thoroughly dissatisfied both with the policy and the spirit of the Ministry of Pensions. He agreed that it was very desirable that they should have had an intimation that week on the stabilisation of pensions, although in effect it only meant that after 1931 the present position of pensions was to continue. He did not criticise the present Minister specially, except that he thought he had been more accommodating to pressure from the Treasury than any other Pensions Minister. The Pensions Ministry had been under the domination of the Treasury ever since January, 1920. He could bring forward any number of cases which had gone through his hands where men had undoubtedly suffered in health very seriously because of the war but were receiving no pension, or only a miserable pension. Lieut.-Colonel Fremantle had spoken about the medical point of view. He (Dr. Shiels) was not particularly concerned at present about the future organisation of the Ministry. The medical point of view in which he was interested in connexion with the Ministry of Pensions was the way in which the Ministry turned down the opinions of medical men, not only panel doctors, many of whom were extremely and naturally indignant, but also well-known specialists, whose opinion was flouted by the Ministry of Pensions. He was not sure that it was by the medical men in the Ministry of Pensions. The medical men in the Ministry were not supreme. But they all knew of cases where a man was told that his case was one which made home treatment suitable; he did not require any hospital treatment, but his case could be dealt with by his panel doctor. He went to the panel doctor, and the panel doctor examined him and said that in his opinion the man required either hospital treatment or specialist treatment, and sent him back to the Ministry. Then the man was pushed backwards and forwards and was refused the treatment which the panel doctor thought was desirable. Even the opinions of medical specialists were set aside. He (Dr. Shiels) thought the Ministry of Pensions should give more heed to the opinions of conscientious medical men who knew the patients, and in many cases knew them before the war, and who understood the change that had taken place.

Mr. MONTAGUE said he did not altogether agree with Dr. Shiels in reference to the point raised by Lieut.-Colonel Fremantle, because he thought that Colonel Fremantle's reference to the use of an efficient State medical service for the civil population was a very big advance towards the point of view that the Labour Party held in regard to medicine and the nation as a whole.

The Minister's Reply.

After further debate,

Major TRYON, Minister of Pensions, said that as a result of the work of a committee presided over by Sir Godfrey Collins, the problem of artificial limbs for ex-Service men had been most satisfactorily settled. He believed that the limbs now supplied were probably the best supplied by any country which took part in the war. He had seen a suggestion that the 6000 men who had lost their reason would get nothing if it was not for the ex-Service Men's Welfare Society. That was a statement which no doubt enabled the Society to obtain funds from the charitable public, but it was absolutely untrue, because that Society under the law was not able to deal with a single one of the 6000 mentally afflicted men in the asylums; and so far from it being the case that the State had done nothing for them, the State had for many years past been spending about £3,000,000 a year on mental cases alone. The doctors of the Ministry were doing a wonderful work for these cases. He did not think the country generally realised how much the ex-Service men owed to the wonderful work which had been done for the sick and disabled by the medical staff of the Ministry. It was true, as Colonel Fremantle had said, that medical science had advanced, and he was glad to see that in a hospital which had hitherto been doing much work for the ex-Service men the great experience gained in connexion with the loss of limbs had been used to help railway men who had lost their limbs in civil employment. In that way they hoped to carry on the medical experience gained through these terrible sufferings, in order that the knowledge so obtained might be of assistance in civil life to other sufferers.

The Bill was read the third time.

SHEFFIELD PENNY-IN-THE-POUND SCHEME.—It is officially stated that this fund will this year be able to distribute £100,000 among the four Sheffield hospitals. Last year the amount so distributed was £88,809, out of a total of £116,816. The balance was expended upon the ambulance, convalescent, and other services. At the end of 1927 the joint debt of the Sheffield hospitals was £59,000 as against £111,000 twelve months earlier.

Correspondence.

"Audi alteram partem."

THE HEART AND CIRCULATION IN BERI-BERI.

To the Editor of THE LANCET.

SIR,—In the St. Cyres lecture, published in your last issue, Prof. Wenckebach has dealt with the problems of the beri-beri heart, and has supplied a most interesting and suggestive explanation of the difficulties met with. At the same time he has introduced a new view of the mechanics of the heart and circulation in connexion with the action of the right and left ventricles. This new view may be correct, but as its acceptance entails the dropping of well-established beliefs some caution is required.

The leading features of the beri-beri heart would appear to be dilatation and weakening of the right ventricle, weakening of the left ventricle, increasing stasis in the liver and venæ cavæ, and a pulmonary circulation completely free from any sign of stasis. These phenomena taken by themselves would suggest a condition of congestive heart failure, but Prof. Wenckebach has accepted the statements of the authorities on this disease that the chief lesion is in the right ventricle, and that the circulatory disturbances are due to its failure. He says that clinical experience has taught him "that in cases of increasing insufficiency of the whole heart the right heart is doomed beforehand to suffer much more than the left, and even to suffer to the profit of the latter." This can only be tested by the effect on the circulation. In cases of the beri-beri heart the pulmonary circulation goes on unimpaired, so that one may assume an efficiency of action and an absence of suffering as regards the right ventricle. On the other hand, congestion of the liver and large veins, with a feeble apex beat and a weak, rapid pulse, suggests that it is the left ventricle which is in difficulty. The teachings of clinical experience as given above may be right or may be wrong, but they do not seem to find much support in the clinical features of the beri-beri heart.

The great function of the right ventricle is to carry on the pulmonary circulation. In the beri-beri heart the weakened and dilated right heart develops incompetence of the tricuspid valve; Prof. Wenckebach says that "blood passes from the right heart backwards into the veins and liver, and the arterial output of the right ventricle is greatly reduced." Here we have the back-pressure theory in all its nakedness, but in spite of this failure of the right heart, "there is no lung stasis, no râles, and no pulmonary œdema." In short, this disabled and dilated right ventricle is carrying on its normal function most efficiently, and at the same time is doing extra work in pumping the blood back into the venæ cavæ and liver until they are gorged with blood. But this is not all the trouble of the right ventricle. "The right heart has to deal with the whole volume of blood returning from the periphery to the heart, *the left heart not receiving more blood than the right heart is able to transmit.* Consequently the right heart is all the time struggling for life against an ever-increasing overfilling and widening, but the left heart is spared a similar burden." But why this life and death struggle of the right heart? Is it so clear that it is the action of the right heart which has over-distended the venæ cavæ and liver? No action or inaction of the right ventricle can produce such stasis of the venæ cavæ and liver when at the same time an efficient pulmonary circulation is being carried on. One can conceive that the right heart may fail to carry on an efficient pulmonary circulation. with some reflux through the tricuspid valve, or that the right heart may carry on the pulmonary circulation efficiently without such reflux, but one cannot conceive that the right heart should be carrying on the pulmonary circulation

successfully and at the same time be pumping the liver full of blood. The closing stages of the beri-beri heart are no less puzzling, for now, at long last, the left ventricle comes into the picture. "At the last moment before death the latter loses its systolic power, succumbs, and leaves the lungs with stagnating blood and signs of ante-mortem œdema." Surely these pulmonary signs are to be traced to a failure in action of the right and not of the left ventricle, and they happen to be the first unequivocal signs of right-sided failure which the lecturer has described in connexion with the beri-beri heart.

Prof. Wenckebach seems to have accepted the statements of the authorities on beri-beri as to the special cardiac changes present, and on this basis he has built a new theory of cardiac physics. He promulgates a new law of the heart as follows: "In equal and increasing feebleness of the whole heart muscle the patient suffers most and dies from the failure of the right side of the heart only." The beri-beri heart may require new views of the circulation and new laws of the action of the two sides of the heart, but there is still something to be said for the old ones. In the beri-beri heart the left ventricle is weakened and the rate is increased. The signs of right-sided failure on which so much stress has been laid might more convincingly be explained by failure of the left ventricle. The engorgement of the liver and large veins, ascribed to the back pressure from the right heart, is now usually ascribed to the diminished forward pressure of the left ventricle. It is the characteristic sign of a failing left ventricle. The total absence in beri-beri of signs of disturbance in the pulmonary circulation—no stasis, no œdema, no dyspnœa—would indicate a right ventricle working at its ease and well within its powers. The arterial output of the ventricle must be quite up to normal, and if at the same time it is pumping blood into the liver, while its muscle is seriously weakened by disease, we have indeed a phenomenon which requires some new law.

Prof. Wenckebach was an honoured guest of the Royal College of Physicians at the recent Harveian celebrations, and saw the demonstration by Sir Thomas Lewis of Harvey's original experiments. Might I suggest that he test the truth of his new views, in the manner of Harvey, by some physiological experiments to show the circulatory correlation between the two sides of the heart? It was not Harvey's theories, but his experiments which carried conviction to the sceptics of his time, and no doubt the same would apply to-day.

I am, Sir, yours faithfully,

London, August 12th, 1928. G. A. SUTHERLAND.

HERPES ZOSTER AND VARICELLA.

To the Editor of THE LANCET.

SIR,—I read with interest the note on p. 264 of THE LANCET, August 4th, and while reports of the development of the two maladies side by side are now too frequent to be of much interest, yet I cannot refrain from mentioning a small epidemic of chicken-pox I saw recently. Occurring as it did in an isolated island district where there was little possibility of outside infection the relationship between the illnesses was very definite.

On Jan. 6th last I was called to see a case of herpes zoster in a woman who had a definite history of previous debility and gastric disturbance. The rash had developed two days before and was unilateral along the course of the right seventh intercostal nerve. On Jan. 12th I was called to see her son aged 25 who had a most profuse and typical varicella with considerable constitutional disturbance, including a sore throat and total suppression of urine for 24 hours. On Jan. 13th a nephew aged 8 years, who had slept with his aunt for several nights and had then returned to his own home about a quarter of a mile away during the week prior to the development of her herpes, developed varicella. He had not been near the house after my visit on Jan. 6th. On Jan. 22nd the child's small brother and sister and a playmate simultaneously developed varicella but showed much less constitutional disturbance.

The cases caused considerable interest and alarm amongst the cottars, who could hardly believe in the origin of chicken-pox. A few years ago my principal had a case of an elderly lady visiting a sick child on her estate. The illness was found to be chicken-pox, and about a fortnight later the lady developed a very severe attack of herpes zoster.

I am, Sir, yours faithfully,

FLORA L. MACDONALD, M.B., Ch.B.,
Assistant General Practitioner.

Isle of Mull, August 11th, 1928.

POST-OPERATIVE MASSIVE COLLAPSE OF THE LUNGS.

To the Editor of THE LANCET.

SIR,—We read with great interest Dr. K. D. Wilkinson's letter in your issue of August 4th (p. 257). In our communication the term collapse is used exclusively in the sense that Pasteur originally intended it—namely, to indicate a complete apneumatosis of the affected lung, deflation being applied to the varying degrees of shrinkage that can occur without complete airlessness. We suspect that Dr. Wilkinson does not intend a similar distinction and this may account, in part, for his attitude towards our theories.

It is recognised that the assumption of the supine position in any circumstances is accompanied by a definite decrease in the vital capacity, or deflation of the lungs. It is our contention that following abdominal operations this is increased by a limitation of the respiratory movements which is partly reflex and partly voluntary in origin. This additional influence is most marked following upper abdominal operations, and for purely mechanical reasons it affects the lower more than the upper lobes, and these in males more than females, but the resulting deflation can never be more extreme than that of forced expiration, and apart from active compression there is only one method by which the lung can become completely airless, that is absorption of the alveolar air following obstruction of the bronchial tree.

The onset of post-operative massive collapse following the obstruction of a bronchus may be insidious, the physical signs when the block is complete being those which have been described as "dead lung." The sign of consolidation appearing only when the obstruction is removed without aeration of the alveolar tissue, but when a lobe which is already deflated becomes collapsed because of the diffuse obstruction of the bronchioles, the initial signs may suggest consolidation, followed later by those of "dead lung," because of the accumulation of secretions, and later still by those of consolidation when these secretions are removed. We think that examination of this hypothesis will explain many of the difficulties which Dr. Wilkinson raises. It is not at variance with a known physiological fact and it does not necessitate the assumption of anything which cannot be confirmed experimentally. We submit, however, that although Dr. Wilkinson's very ingenious theory might account for extreme deflation of the lung it could not account for the absolute airlessness which we regard as an essential of massive collapse.

We have had no personal experience of massive collapse occurring after gun-shot wounds of the chest and elsewhere, but feel that they can be explained by bronchial obstruction, and in this connexion we think that insufficient attention has been given to Curl's observation, that even non-pentrating wounds of the thorax are followed by bronchial hypersecretion which is often almost confined to the opposite lung, due in his opinion to a contrecoup mechanism such as occurs in cranial injuries. Given this hypersecretion and voluntary suppression of the expulsive efforts it is easy to see how bronchial obstruction may arise.

We agree as to the necessity of administering an efficient pre-operative and in some cases a post-operative dose of atropine, and suggest that the favourable reports which Mr. Hamilton Whiteford

gives in his letter may be partly explained by the favourable climatic conditions under which he works and the exclusion of morphia from the routine.

We are, Sir, yours faithfully,

CHARLES R. BOLAND.
J. E. SHERET.

Ancoats Hospital, Manchester, August 8th, 1928.

THE VACCINATION COMMITTEE'S REPORT.

To the Editor of THE LANCET.

SIR,—The report, of which you gave the chief features in your issue of August 4th (p. 233), is a curious document in that its inside bears so little relation to the terms of reference on its outside. We seem to learn from it:—

1. That a certain amount of standardisation of vaccine has been done, but that the relation between any particular vaccinal dose and the immunity conferred by it is unknown.

2. It is recommended that a trial be made of vaccination by one insertion as is done in Canada, instead of by four marks as is at present the law here. Three such vaccinations per person are advocated, the first in infancy, then at school-age, and again between 14 and 16 years of age.

3. It is suggested that vaccination might be performed more aseptically in infant welfare centres than in some homes, and that public vaccinators should inspect their patients twice instead of once.

4. It is stated that vaccination may have some causal responsibility for the encephalitis which occurs ten days after vaccination.

5. Vaccination at epidemic and non-epidemic periods are not considered separately, save that it is assumed, no proof being given, that the revaccinated and those vaccinated in infancy do not contract post-vaccinal encephalitis, and that, therefore, all infants should be vaccinated in order that no person above that age should by primary vaccination run the risk of post-vaccinal encephalitis (a new reason for vaccination, to protect against vaccination).

6. It is stated that their recommendations involve no material change in the instructions to vaccinators under contract—that is, they do not desire any material change in the present methods.

7. It is an expensively printed report, singularly devoid of guidance to those responsible for small-pox and vaccination administration, and though it has taken two and a half years to produce, no attempt has been made to consider the problem from a practical standpoint or to envisage the present conditions.

8. From the reply of the Minister of Health to a Parliamentary question published on the recent bank holiday, it appears that post-vaccinal encephalitis is on the increase. It is therefore a mere question of time before the persons responsible for the vaccination of those children who die of post-vaccinal encephalitis will be considered by some as guilty of constructive murder.

9. Obviously the Committee appointed by the Ministry of Health and the Medical Research Council have regarded themselves as scientific tabulators of facts and have not considered it their function to criticise the department which appointed them. What is wanted now is what I suggested in your issue of Jan. 10th, 1925—namely, a real inquiry into small-pox and vaccination administration in all its bearings by a judge of the High Court; the gentlemen of the late committee should make excellent witnesses, for on the face of their documentary evidence, the sub-department of the Ministry of Health which deals with small-pox and vaccination requires a thorough investigation as to its methods. To cite one question, what is their justification for risking children's lives by vaccination as a protection against a disease which does not imperil their lives? They have, of course, a defence; it should be set out at an inquiry, and its value assessed.

10. The report of the Andrewes Committee of 1923, which only saw the light via the League of Nations about a year ago and is now published in full, should have given the authorities furiously to think. It has not done so, and it is time now that some one, trained to weigh evidence and come to conclusions thereon, should envisage the whole position. No one could better decide how this is to be done than the Lord Chancellor, in his present capacity of acting Prime Minister.

11. A year ago at Hastings I stated my views on the subject printed in No. 4 (1927) of the *Journal of the R.S.I.* The present report and recent happenings seem but to confirm them.

12. The root difficulty has always been that the orthodox regard vaccination as a panacea of universal application, whereas it should be regarded as an insurance proposition, vaccination being only the conferment of a temporary immunity from small-pox which may or may not be worth while under varying conditions. And this difficulty is aggravated by the antivaccinationists who claim that vaccination confers no protection—a manifest absurdity. Supporting their views by many easily refutable arguments they lead the orthodox to a reactive blind acceptance of certain very disputable conclusions.

I am, Sir, yours faithfully,

R. W. JAMESON.

West Wickham, Kent, August 14th, 1928.

EPHEDRINE.

To the Editor of THE LANCET.

SIR,—I have recently been treating several patients with low blood pressure by ephedrine hydrochloride (Burroughs Wellcome and Co.) in doses of gr. ½. In the majority of cases the patients have complained of giddiness and feeling ill after this. These symptoms appear half to one hour after taking the ephedrine, and seem to last about two hours. I have found that gr. ¼ or ½ seems to produce a very satisfactory rise in pressure and no toxic symptoms.

I am, Sir, yours faithfully,

H. W. HALES.

Sheringham, Norfolk, August 14th, 1928.

"FUSSING OVER CANCER."

To the Editor of THE LANCET.

SIR,—At the last session of the International Conference on Cancer, the president warned enthusiasts to beware of fussing over public health, or so, at least, it seems from your summary of this meeting (THE LANCET, July 28th, p. 182). Point was given to his admonition by a statement made by Dr. Stanley Reimann, of Philadelphia, to the effect that he could find no indication of the educational campaign of the last 15 years having had any effect. And yet, Sir, if there is one point in regard to cancer on which practically everyone is agreed, it is that the earlier cancer is detected, the better are the patient's chances of recovery. It might be inferred from this conclusion, so obviously true as really to be a truism, that cancer campaigns throughout the world would devote much of their energies and resources to shortening the interval between the first signs of the disease and the treatment thereof. Why, it may be asked, is there a certain hesitancy in pursuing this matter to its logical conclusion, and in launching educational campaigns with regard to cancer? There are two phases of the period which ends with the commencement of treatment. The first phase lasts from the appearance of the first signs of cancer to the first medical examination, usually made by a general practitioner. The second phase dates from this examination till expert treatment is instituted. For the sake of brevity, I limit myself to a consideration of the first phase.

What are the objections to a publicity campaign conducted anonymously in the lay press by the

leaders of the medical profession? In other words, what is there to prevent a highly respected and representative body of experts from issuing to the public carefully prepared information as to the early signs of cancer? One of the objections most commonly raised is that such an educational campaign would degenerate into scaremongering, and the result would be periodic outbreaks of cancerphobia and new crops of neurasthenics. But however carefully we examine the situation which would arise under such conditions, we cannot find more than two classes of persons concerned—those who are, and those who are not, suffering from early cancer. The first would surely benefit from advice which would lead them to an early medical examination. As for the remainder, they would, if alarmed, in most cases consult a doctor, and in due course be reassured. Another obstacle to an educational campaign is a deep-seated distaste on the part of many doctors to popularising medicine. To some it is a sacred cult, not to be prostituted by widespread publicity. The situation in the world of medicine to-day is curiously similar to the world of theology at the time when Wesley drew his followers from the dim religious light of churches to the secular atmosphere of the hillside. In defence of those who shun the popular health article or lecture as they would pornographic literature, we should remind ourselves that in the past a certain amount of popular health teaching has been undertaken by cranks and persons with some axe to grind. But this class has flourished largely because the field was left open to it by the more respectable members of the medical profession. It does not, however, follow that this field ought itself to be neglected. The presence in it of undesirables should rather be a spur to replacing them by something much better. The leaders of the medical profession who adopt a pose of masterly inactivity in this matter may find it interpreted (or misinterpreted) as a glaring example of timid indolence.

Yet another objection to an educational campaign about cancer is the lack of unanimity among the experts as to even the most elementary matters concerning cancer. They cannot tell the public whether it is infectious or not, hereditary or not. To one all-important question after another they are bound to admit ignorance. It is tempting in such circumstances to wait and see; peradventure the cause and uniformly successful treatment of cancer will be discovered shortly, and then it will be time enough to tell the public. To such arguments in favour of silence there is the unanswerable reply that, to repeat the opening words of this letter, practically everyone is agreed that the earlier cancer is detected, the better are the chances of recovery. And if every woman is taught that a swelling in the breast or an irregular hæmorrhage during the puerperium needs investigation at once by a doctor for fear of its being malignant, many who at present come to a doctor for the first time with an inoperable tumour would be saved. There can be no two opinions on this point. Reserve on the part of the medical profession in this matter may seem lofty and dignified to a few. To candid observers it must seem merely genteel.

I am, Sir, yours faithfully,

August 11th, 1928. D.P.H.

DEATH OF MR. T. B. LAPWORTH.—The death occurred on Thursday, August 9th, at the age of 59, of Mr. Trever B. Lapworth, who was for 44 years associated with the *British Medical Journal*, and for 17 years the head printer. He had been in failing health for some time, and will be sadly missed by numerous colleagues and friends.

AN IMPROVED SYRINGE FOR THE TREATMENT OF VARICOSE VEINS.—We understand that the improved syringe which we noticed in our issue of May 19th, p. 1022, is now made in capacities of 3, 5, 10, and 20 c.cm., while its total length has been greatly reduced by increasing the diameter of the barrel and by using only one ampulla in the capillary tube instead of two as previously. The syringe can be obtained from Messrs. Adair, Dutt and Co., 47, Victoria-street, London, S.W.

Medical News.

MEDICAL SOCIETY OF LONDON.—The programme for the first half of the session 1928–29 has now been issued. On Monday, Oct. 8th, Dr. J. W. Carr will give a presidential address on Medical Ambitions and Ideals; on Oct. 22nd Dr. C. E. Lakin and Mr. Tudor Edwards will open a discussion on the Diagnosis and Treatment of Empyema; and on Nov. 12th Prof. Hey Groves and Dr. James Neal will open a discussion on the Medico-Legal Aspects of Fractures. On Nov. 26th there will be a clinical evening, and the last meeting of the year will be on Dec. 10th, when Dr. Wilfred Harris, Mr. P. J. Verrall, and Dr. James Brailsford will introduce the subject of Sacroiliac Pain. The Lettsomian Lectures will be delivered on Feb. 18th and 27th and March 6th by Dr. H. W. Barber, on Dermatology in Relation to other Branches of Medicine, and the Society's annual oration will be given on May 13th by Prof. Grey Turner, whose subject will be Cancer of the Colon.

MARKING OF SURGICAL INSTRUMENTS AND APPLIANCES.—The Standing Committee (General Merchandise) appointed by the Board of Trade have reported on their inquiry as to whether imported surgical, medical, dental, and veterinary instruments and appliances, and dental supplies and furniture should be required to bear an indication of origin. The report, which recommends that an order in council be made requiring the marking of many imported articles at the time of sale or exposure for sale, is obtainable from H.M. Stationery Office, or through any bookseller, price 2*d.* a copy.

ROYAL SUSSEX COUNTY HOSPITAL.—Dame Anne Beadsmore Smith, Matron-in-Chief of the Territorial Nursing Service, recently opened the two new wings which have been added to the nurses' home of this hospital. These extensions will bring the accommodation of the home up to 108 beds, and comprises rooms for the sisters and a large lecture room. A brief service of dedication was performed by Bishop Russell Wakefield, and prizes were presented to the nurses by Miss K. Scott, who has for 27 years been matron of the hospital.

ABERDEEN ROYAL INFIRMARY.—The Prince of Wales will visit Aberdeen on Aug. 28th, to lay the foundation-stone of the new Royal Infirmary. This will form part of a scheme which will coördinate in one area the services of the Royal Infirmary, the Sick Children's Hospital, the Maternity Hospital, and the University Medical School. The building will cost £400,000, of which about £326,000 has been received.

STIRLING ROYAL INFIRMARY.—The new Royal Infirmary, which was opened by the Duke and Duchess of York on August 10th, has been erected on 15 acres of ground, being part of Wester Livilands estate, which is situated to the south-west of the town. The site is an ideal one from an infirmary point of view. It forms a great, open plateau, beautifully wooded, and commanding magnificent views of the surrounding country on all sides. The building is two storeys high, and contains four surgical wards of 16 beds each, two medical wards of 16 beds each, and one children's ward of 16 beds, with small side wards in addition. The administration department is placed in the centre of the building. There is also a maternity block, which contains two wards of eight beds each, with two single wards and one two-bed ward, accommodating in all 20 patients.

CENTENARY OF ANCOATS HOSPITAL. — On August 11th, 1828, a new "public dispensary" was opened for the districts of Ancoats and Ardwick, which were then suburbs of Manchester. At that time and until about 40 years afterwards patients were treated at their own homes, while out-patients went to the dispensary for advice and medicines. There were then no arrangements for in-patients. In 1872 it was determined to add to the dispensary work "hospital practice," and in 1874 a new hospital with six beds was opened. In 1888 a new wing was added, which brought up the number of beds to 100, with developments in all branches of medical and surgical treatment. Situated as the hospital is in one of the most industrial and thickly populated districts of the city, it is now quite inadequate to the calls made on its services. An X ray department was opened in 1907 and a massage and electricity department in 1913. The board of management have determined to make the centenary celebration the occasion for an appeal for a building fund of £100,000. Land adjoining the hospital has been acquired and plans are ready for an extension with 100 additional beds, a new casualty department, extension of some existing departments, two new operating theatres, and the necessary accommodation for nurses and staff.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

Special two weeks Course in Infants' Diseases at the Infants Hospital, Vincent-square, Westminster.

SECOND WEEK.

MONDAY, August 20th.—2 to 3 P.M., Dr. W. E. Robinson: Chest Cases. 3 to 3.45 P.M., Miss Hughes (Matron of the Hospital): Lecture-Demonstration, Notes on Nursing Sick Infants. 4 to 5 P.M., Dr. Eric Pritchard: Lecture-Demonstration, Dried Milks and Patent Foods.

TUESDAY.—2 to 3.45 P.M., Dr. Eric Pritchard: Feeding Cases. 4 to 5 P.M., Mr. Philip Franklin: Lecture, Nasal Discharge and Sinusitis.

WEDNESDAY.—2 to 3 P.M., Miss Hughes: The Making-up of Feeds. 3 to 3.45 P.M., Dr. Eric Pritchard: Lecture-Demonstration, Infants' Stools. 4 to 5 P.M., Dr. C. C. Okell (at the Wellcome Physiological Research Laboratory, 25–28, Endsleigh-gardens, Gordon-square, W.C.): Diphtheria Prophylaxis.

THURSDAY.—2 to 3 P.M., Dr. Eric Pritchard: Feeding Cases. 3 to 3.45 P.M., Dr. Eric Pritchard: Lecture-Demonstration, Minor Ailments. 4 to 5 P.M., Mr. B. S. Simmonds: Lecture, Surgical Emergencies.

FRIDAY.—2 to 3.45 P.M., Dr. Eric Pritchard: Feeding Cases. 4 to 5 P.M., Dr. M. Maizels: Pathological Lecture, The Regulation of Hydrogen-ion Concentration.

SATURDAY.—2 P.M., Visit to Model Pasteurising Plant, Willesden, and to the Nursery Training School, Welgarth-road, Hampstead.

Appointments.

CROSSE, H., M.D., C.M. Edin., has been appointed a Medical Referee for the Districts of the Aylsham, Downham Market, East Dereham, Fakenham, Holt, King's Lynn, North Walsham, Norwich, Swaffham, Thetford, and Wymondham County Courts.

FACEY, R. VAUGHAN, M.B., Ch.B. Oxf., Medical Officer in charge V.D. Department, Royal Victoria and West Hants Hospital, Bournemouth.

MUSGRAVE, J. A., L.R.C.P.I., L.R.C.S.I., D.P.H., Medical Officer of Health for the County Louth.

Certifying Surgeons under the Factory and Workshop Acts: CONNOLLY, C. V., M.B., B.Ch. N.U.I. (Rothwell); and WALKER, F., M.B., Ch.B. Edin. (Falkland, Fife).

Vacancies.

For further information refer to the advertisement columns.

Aberystwyth, Aberystwyth Infirmary and Cardiganshire General Hospital.—H.S. £200.

Bath, Royal United Hospital.—H.P., H.S., and Asst. H.S. At rate of £120 and £100 respectively.

Bedford County Hospital.—H.S., also Asst. H.S. At rate of £175 and £130 respectively.

Birmingham, General Hospital.—Med. Reg. and Res. M.O. £155.

Blackburn and East Lancashire Royal Infirmary.—Res. H.P. Also Fourth H.S. £150 and £130 respectively.

Bradford, Municipal General Hospital (St. Luke's).—H.P.'s and H.S.'s. Each at rate of £200.

Bristol General Hospital.—H.P.'s, H.S.'s, &c. All at rate of £100.

Bristol Royal Infirmary.—H.P.'s, H.S.'s. Also Dental H.S. Each at rate of £80.

Cardiff, University College.—Lecturer and Demonstrator in Anatomy. £400.

Carmarthen, Joint Counties Mental Hospital.—Jun. Asst. M.O. £300.

Chiswick General Hospital, The Mall, Chiswick, W.—Hon. Surg. Also Asst. Hon. Anæsthetist.

Colchester, Severalls Mental Hospital.—Jun. Asst. M.O. £510.

Croydon County Borough.—Asst. M.O.H., &c. £600.

Dreadnought Hospital, Greenwich.—Surg. to Out-patients.

General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.

Grove Park Hospital, Lee, S.E.—Sen. Asst. M.O. £650.

Hastings, Royal East Sussex Hospital.—Hon. Co-opted Dental Surgeon.

Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—H.P. At rate of £110.

Ilkeston, Borough of.—M.O.H. and School M.O. £800.

Kingston-on-Thames, Surrey County Sanatorium, Milford, near Godalming.—Sen. Asst. Res. M.O. £500.

Leicester, City Education Committee.—Asst. School M.O. £600.

Leicester Royal Infirmary.—Res. M.O.'s. Each at rate of £125.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Manchester, Hulme Dispensary, Dale-street.—Res. M.O. £300.

Manchester, Park Hospital, Davyhulme.—Three R.M.O.'s. One at rate of £150 and two at rate of £120.

Market Drayton, Salop, Cheshire Joint Sanatorium.—Asst. M.O. £250.

Newport, Mon., Cefn Mably Hospital, Michaelstone-y-vedw.—Asst. Res. M.O. £200. Also Third Asst. Res. M.O. at South Wales Sanatorium, Talgarth, near Brecon. £200.

Norwich, Norfolk and Norwich Hospital.—Hon. Asst. Phys.

Nottingham City.—M.O.H. £1440.

Nottingham City Mental Hospital.—Jun. Asst. M.O. £350.

Plymouth, Homœopathic and General Hospital.—H.S. At rate of £100.

Plymouth, South Devon and East Cornwall Hospital.—H.S. At rate of £50.

Rotherham, Rotherham Hospital.—H.P. £180.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.

Southampton Parish Infirmary, Shirley Warren.—Second Asst. Res. M.O. £275.

Swansea General and Eye Hospital.—Sen. Res. O. £250.

Wandsworth Borough Council.—Locum Tenens, Asst. M.O.H., &c. £10 10*s.* weekly.

West London Hospital, Hammersmith-road, W.—Non-Res. Cas. O. £5 5*s.* per week. Also H.P. and two H.S.'s. Each at rate of £100.

Western Australia Lunacy Dept.—Jun. Asst. Res. M.O. £456.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Eastbourne, Sussex; and at Wendron, Cornwall.

Births, Marriages, and Deaths.

BIRTHS.

CARSON.—On August 2nd, the wife of Dr. Hugh Carson, the Hospital, Selly Oak, Birmingham, of a daughter.

GILES.—On August 9th, at York House, Stourport, Worcs., the wife of Dr. O. Pemberton Giles, of a son.

MATHEWSON.—On July 31st, the wife of Dr. W. R. Mathewson, Netherhill, Aberdour, of a daughter.

ROBB.—On August 12th, at Lodge Farm, Melton, Suffolk, the wife of Captain Campbell Robb, R.A.M.C. (retd.), of a son.

RUSSELL.—On August 4th, at Tooting Bec-gardens, Streatham, S.W., the wife of Dr. C. M. Russell, of a son.

TIVY.—On August 7th, the wife of Dr. Eric Tivy, of North Woolwich-road, Silvertown, of a daughter.

TODD.—On August 10th, at Cuckfield, Sussex, the wife of H. C. Todd, F.R.C.S., of a daughter.

WHITEHEAD.—On August 4th, at York Mansions, S.W., the wife of Major N. T. Whitehead, R.A.M.C., of a daughter (stillborn).

MARRIAGES.

ARNOTT—HOWDEN.—At St. Columba's Church, Crieff, Perthshire, on August 8th, by the Rev. N. J. N. Gourlie, M.A., Maurice James, only son of Dr. and Mrs. James Arnott, of Brampton, Cumberland, to Jean Skeffington, elder daughter of Emeritus Professor and Mrs. Robert Howden, of Broomfield, Crieff (formerly of Newcastle-upon-Tyne).

CAPELL—DREW.—On August 11th, at St. Mary Abbots, Kensington, Dr. L. F. Capell, of Cricklewood-lane, N.W., to Dorothy Edith, only daughter of the late William Godson Drew, of Hove, Sussex.

LORRAINE—WILSON.—On August 9th, at St. Mary's Parish Church, Knebworth, J. C. Lorraine, M.D., F.R.C.S. Edin., of Montpelier-square, S.W., to Alicia Hill, daughter of Mr. and Mrs. Wm. Wilson, of Knebworth.

SELLORS—LYELL.—On August 8th, at St. Jude's Church, Kensington, Thomas Holmes Sellors, B.M., B.Ch., M.A., to Brenda Murray, daughter of Mrs. W. D. Lyell, Courtfield-gardens, S.W.

THOMAS—NEWCOME.—On July 31st, at St. Gabriel's Church, Warwick-square, London, Ellis Rae Thomas, M.D., M.R.C.S., L.R.C.P., to Lilian Gladys, fourth daughter of the late Chester Pern Newcome, of Long Clawson, Leicestershire.

DEATHS.

CAMBRIDGE.—On August 12th, at Crouch Hill, Thomas Arthur Cambridge, M.R.C.S., L.S.A., aged 82.

CHILDS.—On August 6th, at Rock House, West Looe, Cornwall, Christopher Childs, M.D., aged 81.

DAVIDSON.—On August 11th, at Over Frays, Uxbridge, John Davidson, M.B., aged 70.

EASTES.—On August 8th, at Manor-road, Folkestone, Thomas Eastes, M.D., aged 78.

GREY.—On August 10th, at Harrold, Bedfordshire, suddenly, from pneumonia, Egerton Charles Grey, M.A. Camb., D.Sc. Lond., M.R.C.S., L.R.C.P., F.I.C., late of Cairo.

KERSWILL.—On August 10th, at Sackville House, Sandwich, Harry Kerswill, M.R.C.S., L.R.C.P., aged 60.

OAKDEN.—On August 12th, William Marshall Oakden, B.A., M.B., B.Chir. Camb., F.R.C.S. Eng., Medical Superintendent of St. Luke's Hospital, Lowestoft, aged 41.

TUXFORD.—On August 8th, at Wide Bargate, Boston, Arthur Tuxford, J.P., M.D., aged 87.

WHERRY.—On August 12th, at Cambridge, George Edward Wherry, F.R.C.S., aged 76.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

NOTES ON

THE SLACK ABDOMINAL WALL.

By Lieut.-Colonel J. K. McConnel, D.S.O., M.C.,

MEMBER OF THE CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.

THE following aims at placing the treatment of this condition on to a scientific basis; it is hoped thus to avoid the criticism in Allbutt and Rolleston's "A System of Medicine": "The treatment ceases and, when a sufficient time has elapsed to undo the good which has been done, the patient becomes as bad as ever." The writer asks forgiveness for the extensive quotations in the following lines, but he feels it important to base his arguments on sound authority.

When one investigates this subject, one is in danger of becoming bogged in the voluminous literature that discusses ptosis of the abdominal contents—either severally or collectively. A direct attack on the viscera themselves has not led to very gratifying results and, as is stated in "Modern Medicine" (Osler and McCrae): "The treatment is in the main rather unsatisfactory. . . ."

In order to concentrate our attention on the musculature of the weak abdominal wall, let us take as a simile a motor tyre in which a bulge has appeared. Supposing one finds no replacement at the nearest garage, one may instruct the mechanic to insert a sleeve between the two tubes. In these circumstances no one would blame the air inside for having caused the distressing symptoms, but one would do one's best to overcome the defect in the outer cover and render it an adequate support for its contents.

In the same way several authorities have noted the disappearance of symptoms of visceroptosis, when a suitable support has been applied. Prof. Starling stated: "These viscera in the normal condition are pressed against the under surface of the diaphragm by the elasticity of the abdominal wall." Sir Arthur Keith[1] states: "Now, as is well known, when a living subject raises his body to the sitting or standing posture, the upper viscera do not drop more than ½ or ¾ in.; the ligaments and mesenteries can therefore take no part in sustaining the viscera. The supporting structures are the muscles of the belly wall; particularly is the transversalis muscle important in this respect; it is a living belt which girds the loins."

Let us now leave the viscera and turn our attention to the abdominal wall.

Muscle Action.

Before pursuing the argument it seems advantageous to summarise certain characteristics of muscles. Prof. Starling, in his "Principles of Human Physiology," wrote as regards muscular tone: "Every muscle in the body is in a condition of slightly continued contraction which keeps it tense, so that when it contracts in response to a stimulus, there is, so to speak, no "slack" to be taken up before the muscle begins to pull on its attachments. . . . The tone of the muscles is a reflex phenomenon and is dependent on the integrity of the reflex arc governing the muscles in question. It has been shown by Sherrington that the afferent part of the arc is represented by the afferent nerves from the muscle itself. . . . To this system of afferent nerves Sherrington has given the name of the proprioceptive system, since it is excited, not directly by changes in the environment, but by alteration in the animal itself."

A muscle may act in four ways. It may remain at rest, may contract, may "hold," or may relax. Patients sometimes think that muscles can push; at least, they explain movements in terms that would necessitate this. Contraction may take place actively, as when causing a movement, or as a passive shortening, when the energy required for a movement is supplied by some outside force—e.g., gravity—another person, a spring, &c. During an active contraction energy produced by a muscle is impressed on the system to which it belongs through the medium of its attachments or else hydrostatically. As an example of the latter we may take: "The contractions of the skeletal muscles squeeze the veins contained within them, and drive the blood on towards the heart."[2]

Following the classification of muscles in a normal act[3] as given by Dr. Kinnier Wilson, we find:—

1. *Prime movers, or agonists*, which initiate the act.

2. *The antagonists*, which would tend to interfere with the above movement, if they were not reciprocally inhibited.

3. *Synergic muscles* (synergists), which neutralise undesired actions, as when a prime mover, by passing over two or more joints, might give two or more actions, one being desired.

4. *Fixation muscles* (fixers), which provide firm origins from which the others may act.

In a firm closure of the fist the agonists are the flexors of the thumb and fingers, and antagonists are the extensors of the same; as synergists we find the extensors of the wrist, and as fixers the flexors and extensors of the elbow and many other muscles as well. Movements of coöperation also take place;[2] of these one may mention arm-swinging in walking.

The Abdominal Wall as a Muscle.

Turning now to the behaviour of the abdominal wall as muscle, we find its activities intimately related to other groups of muscles. We see a "great cylinder" (Keith), the sides of which are formed by the erector spinæ, quadratus lumborum, and the abdominal wall, while the top and bottom are imperfectly closed by the diaphragm and the pelvic floor. Sir Arthur Keith states: "We are apt to forget that the chief muscles of the belly wall, the two recti, the external obliques, and the internal obliques are primarily muscles of the spine; they are powerful postural antagonists of the component elements of the erector spinæ muscles. . . . The student is so apt to concentrate his attention on the respiratory action of the ribs that he forgets that they are the most powerful of the spinal levers. All the muscles attached to the ribs—the intercostals, the rectus abdominis, and oblique muscles of the belly wall—are prime movers and balancers of the spine."[1]

The abdominal wall, being antagonistic to the diaphragm, acts as a respiratory muscle; it contracts during expiration, forcing the latter up, the energy being transmitted hydrostatically. Prof. Starling wrote: "In fact, Sherrington's results on the coördination of muscular movements would tend to make us assume inhibition of the tone—e.g., of the abdominal muscles, during inspiration, and active augmentation of tone during expiration. Where the tone of the muscle is entirely lost—e.g., in the condition of visceroptosis—it has been observed that the diaphragm is thrown out of action, breathing being chiefly carried out by an elevation of the upper part of the thorax."

We must now refer to the action of the abdominal wall in a movement which may be termed "flattening out the lumbar curve," as it will be made use of during treatment. It can take place in any position, but one should realise that, unless the lumbar erector spinæ relax reciprocally, it cannot occur. During this movement the abdominal wall is normally the prime mover, but in certain positions, such as lying supine or reclining in a chair, gravity assists and, in fact, may supply the entire energy requisite for the movement, while the abdominal wall merely shortens passively. Under some conditions the movement is assisted by contraction of gluteus maximus and the hamstrings. When the action of these muscles becomes of importance, it will be seen that the movement approximates to a rotation of the pelvis, and that this rotation would, for instance, in the standing position, take place about an axis drawn through the hip-joints, whereas in other positions a variation from this axis would occur. For practical purposes this rotation, which is an important factor in treatment, may be described as "turning the tail between the legs," and it is interesting to notice the coöperation between the abdominal wall on the one hand and the gluteus maximus and hamstrings on the other. The rotation may be readily perceived by laying the hand on the sacrum, though not, however, on gluteus maximus, if this latter is strongly developed.

One further point before passing on: Should a patient maintain a contraction of the erector spinæ, make a contraction of the abdominal wall and, at the same time, hold his breath, one then observes that his chest is forced up. This combination of muscle actions frequently occurs when a patient tries to flex or to flatten the lumbar spine.

Tone.

As regards the tone of the abdominal wall, Sir Arthur Keith[1] states: "The moment we assume a sitting or a standing posture there is set going a reflex mechanism which throws the muscles of the belly wall into a state of postural tone." This, of course, refers to the normal individual who has a satisfactory abdominal wall. From earlier quotations we see that this tone depends primarily on proprioceptive impulses from the constituent muscles themselves, and should note that the alternate inhibitions and augmentations of tone reciprocally in relation to the diaphragm tend to keep the abdominal wall in a healthy state.

In one type of individual we find a slack abdominal wall associated with a marked lordosis or increase of the lumbar curve. As regards the obese variety of this type, there is, in Dr. W. F. Christie's "Surplus Fat and How to Reduce it," a clever sketch entitled, "Election Day at the Fat Man's Club." The next gentleman to enter in is depicted

sideways on, displaying a magnificent "object in view," as a large tummy is sometimes called, and one notices a strongly developed lordosis. It has been found that a proportion of this type, both the obese and the thin varieties, suffer pain in the lumbar region, and often it is for this reason that they submit themselves for treatment. This pain may arise in the joints—vertebral or sacro-iliac—or else in the muscles and surrounding structures; if in the latter, it is due to the presence of waste products, to strain or to spasm required for the fixation of painful joints, and in any case a lack of coördination of the constituents of the muscle group is likely to be a factor of some importance.

Anyone who wishes to appreciate the condition of this type of patient should clasp with both arms a heavy weight, holding it about the level of the umbilicus, and walk upstairs. Balance is preserved by canting the upper part of the body backwards, maintaining this attitude by a contraction of the lumbar muscles. After mounting several flights of stairs in this way a pain in the back may become quite noticeable. When a group of muscles finds itself antagonistic to another strong group held in contraction, its tone tends to be inhibited. Such an inhibition of tone tends to be forced on the abdominal wall whenever the lumbar muscles are held in spasm. It will thus be realised that normal activity of the abdominal wall in relation to the diaphragm tends to improve the tone of the abdominal wall, whereas spasticity of the lumbar muscles tends to depress it.

Another type of individual has a thin and sagging abdominal wall, but without any undue lumbar curvature or, in fact, with a deficiency thereof. As a rule, the cervical curve is exaggerated (ewe-neck) in order to assist in giving a horizontal line of vision, the tilt of the eyes, the relation of occiput to atlas, and the dorsal curve being variables in this respect. As will be shown later, the proprioceptive messages from the prevertebral cervical muscles are an important factor in the tone of the abdominal wall. In this type of patient the abnormal balance between the post and prevertebral cervical muscles is the key to the situation.

We must refer briefly to alterations of tone of the abdominal wall due to impulses which arise in the afferent nerve-endings of the viscera. On the one hand, rigidity of the former is a well-recognised symptom of acute conditions in the latter, while on the other hand Sir C. Sherrington demonstrated that when the afferent nerves from the viscera are severed, the abdominal musculature loses its postural tone.

Posture.

"In the maintenance and recovery of posture many separate types of reflex converge to produce a common result, and these reflexes arise from such sense organs as the labryinth, the eyes, and the muscles themselves. The removal of the central hemispheres has but little effect on normal posture or on righting reactions by which that posture is resumed after having been interfered with. It is clear, therefore, that these reactions are true reflexes, and it would be quite wrong to imagine that the animal knows that its posture is being upset, resents interference, and voluntarily acts in such a manner as to counteract the offence." [4]

"Consciously, we are in complete ignorance of the specific muscular units effecting a 'voluntary' movement. . . . The point at present is that a very large part of every 'voluntary' movement is both 'involuntary' and outside consciousness." [3]

Prof. Magnus's researches have classified these reflexes in terms of the organs from which the stimuli arise, also as to whether they refer to movement (stato-kinetic) or rest (static), both as regards "pose" or "righting." "In general we can say that by means of the stato-kinetic reflexes the body is brought into its normal pose, which pose is maintained by the operation of the various static reflexes. It will have been noticed that the head plays an important part in deciding most of these responses. The head contains the organs of special sense, particularly the distance receptors for sight and sound, so that the head tends to be voluntarily directed towards stimuli which affect these sense organs. The proper orientation of the remainder of the body which ensues is effected by the action of the various reflexes which have been described." [4] Dealing with the same subject, Prof. Starling wrote: "In the evolution of the nervous system there has been a continual subordination of the hinder parts to the head end, in consequence of the development at this end of the all-important distance receptors, the impulses from which take a predominating part in determining the reactions of the body as a whole."

Dr. Kinnier Wilson's example of muscle action, when firmly closing the fist, may be amplified. If it took place in a standing or sitting position, the muscle action of the trunk, coördinated to maintain posture, would be synergic and also would fail to obtrude into the field of consciousness. The man would not notice the pose of his body, which would be taken up in accordance with his normal habit.

Sir Arthur Keith [1] points out that the spine of the human baby changes from the primitive curve in the second year of life, and adopts the lumbar curve. This alteration takes place through the medium of the spinal muscles—the spine's balancers. We must not consider this lumbar curve as fixed, but rather as varying continuously to suit the requirements of the moment. The same applies, and even more so, to the relative tension of the balancing muscles. One might argue that, while this curve is being established, consciousness takes it into account, but certainly later it passes unnoticed, unless commented on by a parent. The child is consciously concerned with his hand movements, &c., and only gross mis-balances of the lumbar and abdominal muscles are recognised. We thus see that it is possible for an undue contraction of the lumbar muscles to arise in early youth and develop, so to speak, along with the child; this contraction would merely be a failure to adapt the body to its environment. The so-called "pot-bellied" type of child constitutes a more serious condition than the above; the disturbance in this case is probably visceral in origin.

As a rule, it is probable that a lumbar spasm, as we now can term it, arises as a secondary condition to a mal-posture of the shoulders and dorsal region. The child gets tired either when standing or sitting; the shoulders droop and the dorsal region becomes round. The parent or teacher, thinking of the contracted chest, says "sit up," directing the child's attention to its head and also, perhaps, to its shoulders. As the levator anguli scapulæ rhomboid-serratus magnus sheet of muscle, as well as the dorsal muscles, are tired, the child compensates in the easiest possible manner, namely, by contracting the lumbar muscles and, by inducing a lumbar curve, makes the dorsal curve less apparent and the cervical lordosis (ewe-neck) less pronounced—". . . sitting bolt-upright is particularly exhausting, especially for young people . . ." (Keith.)

When dealing with patients who have a slack abdominal wall, it is usually noticeable that, in the erect position, attempts to flatten the shoulders or decrease a dorsal curve are not limited to the correct muscles, but irradiate downwards to the lumbar area, or sometimes upwards to the cervical region. Before treatment they are virtually unable to contract alone the dorsal muscles; this is so even after the movements concerned have been performed passively to ensure they realise what is required.

Brief reference must be made to conditions that may arise subsequent to pregnancy; treatment is discussed in "A Textbook of the Practice of Medicine" (F. W. Price). It appears that the lumbar spasm—accompanied by pains in the back—which is so often a feature of the last few months of pregnancy, occurs in the effort of preserving balance when walking or standing. In some cases this postural habit persists after childbirth, although the stimulus which gave rise to it is no longer present; such conditions as tender sacro-iliac joints, if inadequately supported, would encourage this persistence. It is suggested that this lumbar spasm militates against and tends to delay the recovery of the stretched abdominal wall, the proprioceptive impulses from the former tending to reduce the tone of the latter.

Proprioceptive impulses from the neck muscles have already been mentioned as a stimulus which increases the tone in the abdominal wall. Prof. Magnus's cinematograph films of falling cats, which showed the head righting first, and then the body, indicate a chain reflex compounded from a labyrinthine reflex as regards the head and a neck reflex as regards the body. When teaching a horse a correct "reining back"—the forefeet moving first, so as to arch the spine and necessitating a full contraction of the abdominal wall—one notices the extreme importance of a correct muscle balance in the neck. When teaching patients a good neck posture they frequently, on their own initiative, draw attention to the increased tone in the abdominal wall, which accompanies their newly-acquired neck movement. This can be demonstrated both when lying and when erect; it is certainly not merely a transient stretch reflex. Unfortunately, little research seems to have been done on this point, but it appears certain that the neck reflex which accompanies a good neck carriage is an important factor in human posture.

Sir Arthur Keith draws attention to the difference between a power of voluntary contraction and a condition of postural tone. An abdominal wall may be excellent when voluntarily contracted, and yet a few minutes later, when the patient's attention has been directed to something else, it may revert to "C3" as regards postural tone. We can state the conclusion that a posturally slack abdominal wall is associated with either an undue lumbar spasm or a deficient tone in the prevertebral neck muscles, or with both. Healthy exercise in relation to the diaphragm helps to maintain the abdominal wall in good condition and delay its degeneration. Teaching relaxation of the antagonist is the first principle of re-education as laid down by Dr. J. B. Mennell; [5] it is

undoubtedly the first step in a rational treatment of a slack abdominal wall.

Reflexes.

We find ourselves faced with a problem of postural reflexes and, in order to follow the subject to its logical conclusion, we must invoke the aid of Prof. Pavlov's researches, from which we can obtain valuable assistance. It is not easy to recognise at first sight exactly with what we are dealing; for instance, the supposed inborn reflex which Pavlov extensively employed—namely, the "salivation of animals on sight and smell of meat—is not an inborn or unconditional reflex, but an acquired one."; [4] it is probable that it is predisposition to such a reflex which is transmitted by heredity. Are we dealing with an inborn reflex in the case of the lumbar muscle tensions or in the case of belly wall (see previous quotation from Keith)? If so, to what extent are they inherited, and how much conditioned by the experience of the individual?

In point of fact Pavlov himself inhibited an inborn reflex by means of another one, as he records in his work "Conditioned Reflexes." As Prof. Starling stated: "It is however possible to extinguish artificially a (conditioned) reflex in the course of a few minutes. Such an experimental extinction of conditioned reflexes can be obtained by arranging the conditions of the experiment, so as to break the first law of conditioned reflexes, namely to use the conditioned stimulus several times in succession without combining it with the unconditioned stimulus." Thus the deleterious effects of either type of reflex can be got over when desirable, but we must beware of inhibiting inhibitions which we are trying to establish.

Let us take it that, at the present stage of the development of our race, the muscular contractions inducing those compensatory spinal curves which are designed to keep the head level, &c., in the most satisfactory manner, are an inherited reflex. Groups of stimuli from the labyrinth, neck, &c., that arise on the assumption of the erect position, act in relation to the above. In the normal human being the erect position evokes an increased tone in the belly wall (Keith). We must remember that from the assumption of the erect position there does not result just a single stimulus but a group of stimuli, some or other of which may predominate in each individual. Pavlov found that such factors as old age, pregnancy, distension of the bowels, ill-health including digestive troubles, drugs such as caffeins, bromides, alcohol, &c., altered the relative intensity of excitation and inhibition. Under these conditions it is simple to imagine how the normal reflex in relation to the erect-position group of stimuli becomes inhibited and at first some, then more, of these stimuli come to "condition" the increased tone of the lumbar muscles and to have a reciprocal effect on the abdominal wall, as already described.

Treatment.

The outline of treatment consists of dissociating the postural stimuli from the patient's undesirable postural motor reactions, and then linking them up with those that are more satisfactory. The patient practises on the one hand, the required muscle actions—individually or in groups—in positions in which the postural stimuli of the erect position either do not operate or are naturally inhibited. On the other hand, the same postural stimuli are allowed to act under temporal or spatial conditions, in which they do not call forth his undesirable reactions. Thirdly, the patient is shown how to encourage the linkage of stimuli with a satisfactory posture. Besides this he must appreciate from the outset how to avoid undoing the results of his efforts during the intervening periods, until the new postures become automatic when conscious effort is no longer required.

The use of stretching exercises to deal with spasticity in the lumbar region would not appear to produce the best results. As a rule, forcible stretching is not required and if it were, the patient's condition would probably lead to it being contra-indicated. It is far wiser to teach a relaxation and trust that such stretching as is necessary will come with improved function.

Following the lead of Pavlov's work, we see the importance of the "erect position" being really a group of conditioned stimuli instead of being a single one. A man who has just learnt to relax his lumbar muscles when sitting in a certain chair may not be able to repeat this under slightly different conditions—e.g., in a chair with a lower seat or back at a different slope. He certainly cannot repeat the relaxation at once when standing; this is important, because patients are inclined to try and estimate progress when standing up at the termination of a treatment. Pavlov shows that with dogs, stimuli from other parts of the brain effect conditioned reflexes both as regards synthesis and inhibition—with human beings this must occur to a still greater extent—thus the memory of failure or success in a movement or exercise may make a vast difference to results. In this postural work one finds that what suits one patient is virtually useless with another, although the conditions appear to be almost identical.

From the foregoing one can guess that exercises in the erect position should be given with caution at first. In "sitting" one can use from the outset certain relaxation postures and exercises, but in "standing" anything of the kind is contra-indicated, as it would tend to inhibit the inhibition we are developing. Certain uncommon positions are of extreme value, as for instance, "hands and knees"; provided the heart, &c., permit, there appears no objection to the assumption of this position, as patients over 70 years old, and others over 20 stone, have taken to it eagerly. These uncommon positions have an advantage of being a virgin field as regards stimuli; in them the stimuli have never been wrongly connected and so do not require to be inhibited. Lying positions are of the greatest importance, as is so strongly advocated by Dr. Joel E. Goldthwait.

One must say, however, that it is essential to connect what is learnt in the above positions with what one wishes to take place in "standing" or "sitting." This can be done either by a steady transition from one position to another, or by the patient grasping a similarity of joint movements, muscle actions, &c., noting the varied effect of gravity on the different parts of his body. Another useful method is to arrange that the contractions of the postural muscles are synergic to other muscles, whose activity is for the moment vividly within the field of consciousness. Synergism is thus used as a stepping-stone between voluntary effort and normal postural activity. Incidentally, in this way, a patient is led on from the idea of a correct posture, when his body is at rest, to one when he is in motion.

As Prof. Starling wrote: "The shorter the intervals between the successive presentations of the conditioned stimulus the quicker the extinction." This, of course, applies equally to the re-synthesis. "A conditioned reflex which has undergone such extinction, however, regenerates spontaneously after a few hours. . . . Repeated extinction has much more profound effect, and the spontaneous regeneration of such reflexes is progressively slower and less complete so that after having undergone several extinctions, the reflex disappears altogether." [4] Tri-weekly, or even daily, treatment in gymnasiums where patients undertake complicated exercises, difficult to repeat except under the eye or with the help of a gymnast, do not appear likely to give the optimum results. To obtain these, it seems best to visit the patient and work in his own study and/or bedroom, so as to show him exactly how to use his own chair, sofa, &c., to the best advantage. "Little and often," as Dr. J. B. Mennell points out, should be the rule; practice at decreasing intervals soon makes a posture automatic and re-establishes a good habit. One must show the patient movements and relaxation postures applicable to various occasions, those for before rising and after retiring, those for use when turning over a leaf of his paper, when strap-hanging in the tube, sitting in the car or bus, when "dummy" at bridge—no one would notice that a curative process was in progress, so there would be no cause for comment or laughter.

Reference has been made to relaxation postures. These are most important. As examples, one may cite: sit with one's feet on a footstool so as to avoid an undue lumbar curve; have a pillow under the knees if taking breakfast in bed; lie on one's side with the knees drawn up, especially if this is associated with "turning the tail between the legs." This tilting of the pelvis is of course one of the most valuable movements. Many patients are unable at first to contract gluteus maximus or the hamstrings to assist in the movement. In this case contraction of the specific muscle is best learnt alone—for example, when reclining against pillows in bed, straighten out the hip-joint and slide down in bed. No one, unless paralysed, &c., could fail to do this simple movement, and the required contraction, after having been felt, can be performed in other positions and in combination with that of other muscle groups.

Looking glasses are useful during treatment, as ocular demonstration has a great power of suggestion. The usual three-quarter length wall-glass and a hand, or other portable, mirror will suffice; they are especially valuable when teaching neck postures. Shadowgraphs and a blackboard have been advocated for postural instruction. [6]

The number of treatments required depends largely on the voluntary control the patient has over his various muscles. An incoördinate patient who has never been accustomed to games of skill will take longer, especially if he has extreme weakness of the abdominal wall and spasticity in the lumbar region, than one who has to some degree trained for sport or athletics. Additional disturbances, such as round shoulders, a contracted chest, especially in elderly people, increase the difficulty of obtaining a satisfactory result and, consequently, the length of treatment. Sometimes it is found that even a couple of treatments suffice to put a man on the right road so that he can

continue to develop good habits by himself. It is taken for granted that during a treatment of the nature described in these notes, the medical practitioner in charge of the case will prescribe such medicinal or other treatment as he deems advisable. One must add, in conclusion, that the feeling of well-being that comes from an improvement in portal circulation and greater activity of the abdominal wall is sufficient incentive for a patient to continue the slight amount of effort that is needed.

I am permitted by Sir Arthur Keith to say that, in his opinion, facts are brought to light in this communication which would be useful in practical therapeutics, and which, while well known to workers along the special line, are not necessarily equally well known to practitioners. This has encouraged me to publish the notes.

References.

1. Keith, Sir Arthur: Hunterian Lectures on Man's Posture, Its Evolution and Disorders, Brit. Med. Jour., 1923, i., 451 and seq.
2. Wright, Dr. S.: Applied Physiology, London, 1926, p. 208.
3. Wilson, Dr. S. A. K.: Croonian Lectures on Disorders of Motility and Muscular Tone, THE LANCET, 1925, ii., 1 and seq.
4. Evans, Prof. C. Lovatt: Recent Advances in Physiology, London, 1925.
5. Mennell, Dr. J. B.: Massage, its Principles and Practice, London, 1920, pp. 239 and 229.
6. Ewerhardt, Dr. F. H.: Physical Means in the Correction of Certain Lower Backaches, Arch. Physical Therapy, 1928, ix., 249.

NAVAL TRAINING ASHORE.

THE good training ship, H.M.S. *St. Vincent* (Portsmouth), seems like Antæus to have gained fresh vitality since it touched mother earth and took over the old Marine Barracks at Gosport. Surgeon-Commander H. W. Nicholls tells in the *Journal of the Royal Naval Medical Service* for July of the comfort and care which surround these bluejacket boys, of whom there are at present about 600. During a nine months' stay a boy adds on the average 8 or 9 lb. to his weight and 2 to 3 inches to his height. The boys are housed in four blocks, with a separate building for new entries. Heating is by radiators throughout; in winter dormitories are warmed up from 2 A.M. until the boys have finished dressing and fires are lighted early in the school rooms for the work which is done there before breakfast, Commander Nicholls believing these early hours to be the danger period. Special attention is given to providing green vegetables which he finds discourage boils. The routine baths are hot and cold showers, and are fully used, voluntarily, too, after games. Physical training, in which games play a large part, produces remarkable results; the boys take quickly to hockey and Rugby football, but some prefer reading, and there is no compulsion. There is a covered swimming bath. Among new entries there were seven cases of mumps, four of scarlet fever, in nine months; apparently none among "old boys." There are 26 beds in the sick bay; work in the ship is strenuous, and the common form of "going sick" is a tiredness which is slept off in 24 hours, duty being resumed in 48. Recruits are coming in more from Gosport now, where parents see how well off the boys are. The medical officer notes with admiration their ability to eat a two-course dinner in seven minutes, without ever a complaint of indigestion. It is pleasant to know that another wooden training ship, with its risk of infection from confined space, has been disestablished. Ut exeant omnes!

IS THERE A NEUROTROPIC SPIROCHÆTE?

MANY of the reports on acquired syphilis in family groups emphasise the frequency of neurological complications, and invoke the influence of a so-called neurotropic strain of *Spirochæta pallida*. H. Noguchi and other workers distinguished this strain from the "dermatropic" by its size and variations in its incubation characteristics in experimental animals, as well as by its results. There is a school of thought which holds that infection from a common source tends to produce the same type of syphilis in all who catch it. A number of investigators, however, believe that the soil is more important than the parasite in determining the form of the manifestation. The former produce evidence of the disease, taking the same form in husband and wife; J. E. Moore and A. Keidel studied 111 married couples and found that in 57 per cent. of the cases with parenchymatous neurosyphilis the partner also had neurosyphilis in some form. A similar experiment at the Mayo Clinic, however, only yielded 22 per cent. of positive results.

In order to see what evidence could be produced on the other side, that of the predominance of family characteristics, Dr. P. A. O'Leary and Dr. M. W. Rubenstein have investigated [1] 13 families whose members had acquired syphilis from different sources. They eliminated patients with any signs of congenital syphilis or parental history before the birth of children, and exacted clinical and serological evidence of syphilis, and a history of chancre followed by secondary signs. There were four groups of sisters, two of brothers, two of brother and sister, two of mother and son, two of mother and daughter, one of father and son, and one of mother, son, and daughter. In seven families more than one member, in two neither member, and in four families one member only had neurosyphilis.

Although these observers agree that trauma, disease, virulence of the organism, and the type of treatment are important factors, they see in their results evidence for the greater importance of the family characteristics. The results of treatment gave a more striking indication of the working of this factor, for in five out of the seven families with neurosyphilis all the members responded favourably, while in the other two none responded. The conclusion seems to be a sensible one, but the smallness of the number investigated throws doubt on the evidential value of the experiment.

NEW PREPARATIONS.

Eukodal.—This analgesic preparation, supplied by H. R. Napp, Ltd., 3 and 4, Clements Inn, Kingsway, London, is introduced as an ideal substitute for morphine. Codein is not held to be dangerous as an addiction drug, and has been excluded from the Dangerous Drug Act. The formula is given as dihydroxy-codeinon hydrochloride, and it is claimed both to be an excellent substitute for morphine and of great value when used in conjunction with morphine. The narcotic and analgesic effects are produced when the drug is administered orally, where its employment is specially recommended for allaying irritative cough, while to meet cases of pain subcutaneous injections may be employed.

The same firm sends us a new theobromine preparation, *Theosol*, whose full formula is theobromine calcium salicylate, a formula which explains the intentions which have led to the preparation of the drug. The indications for its use are probably familiar to many of our readers; this combination has been recognised of value in arterio-sclerosis and asthma of the cardiac form, and is also found to possess diuretic qualities.

LONGEVITY.

THE *Times*, on August 13th, devoted a leading article to Mr. Li Ching Yun, who is alleged just to have celebrated his 250th birthday, the representative of the *North China Herald* having visited him and found him quite well. His name is at any rate worth putting on record, as Thomas Parr with his 153 years is put completely in the shade. Some people are doubtful of Parr's credentials, but in December, 1926, the death was reported at Constantinople of Zaro Agha at the age of 153, and mention was made then of Teku Oglu Ali Agha, aged 147. In November of that year, also, the death was reported, at the age of 135, of Maria Ustav, in Carcaliu, Tulcea, Dobruja, Roumania, who lived on vegetables and fish and was a strict teetotaller, but no doubt consumed the soured milk of the country to which the number of centenarians in Bulgaria and Roumania is largely attributed. It is presumed, of course, that the Chinaman has not been celebrating his birthday every six months.

INADVERTENCE.

IN reply to natural expostulation we admit that the advertisement wherein an impossible virtue was claimed for a particular ointment was inserted without due attention to its contents. We much regret the inadvertence.

[1] Minnesota Med., June, 1928, p. 406.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	.. .. ..	£2	2	0
	Six Months	.. .. ..	1	1	0
	Three Months	.. .. ..	0	10	6
ABROAD	One Year	.. .. ..	2	10	0
	Six Months	.. .. ..	1	5	0
	Three Months	.. . ..	0	12	6

Subscriptions not paid in advance are charged out at the published price of 1s. per copy, plus postage. Cheques and P.O.'s (crossed "Westminster Bank, Ltd., Covent Garden Branch") should be made payable to THE MANAGER, THE LANCET Offices, 423, Strand, London, W.C. 2.